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Feld: A Report from Paris and Prague
Ganz: Emerging Patterns of Urban Transport



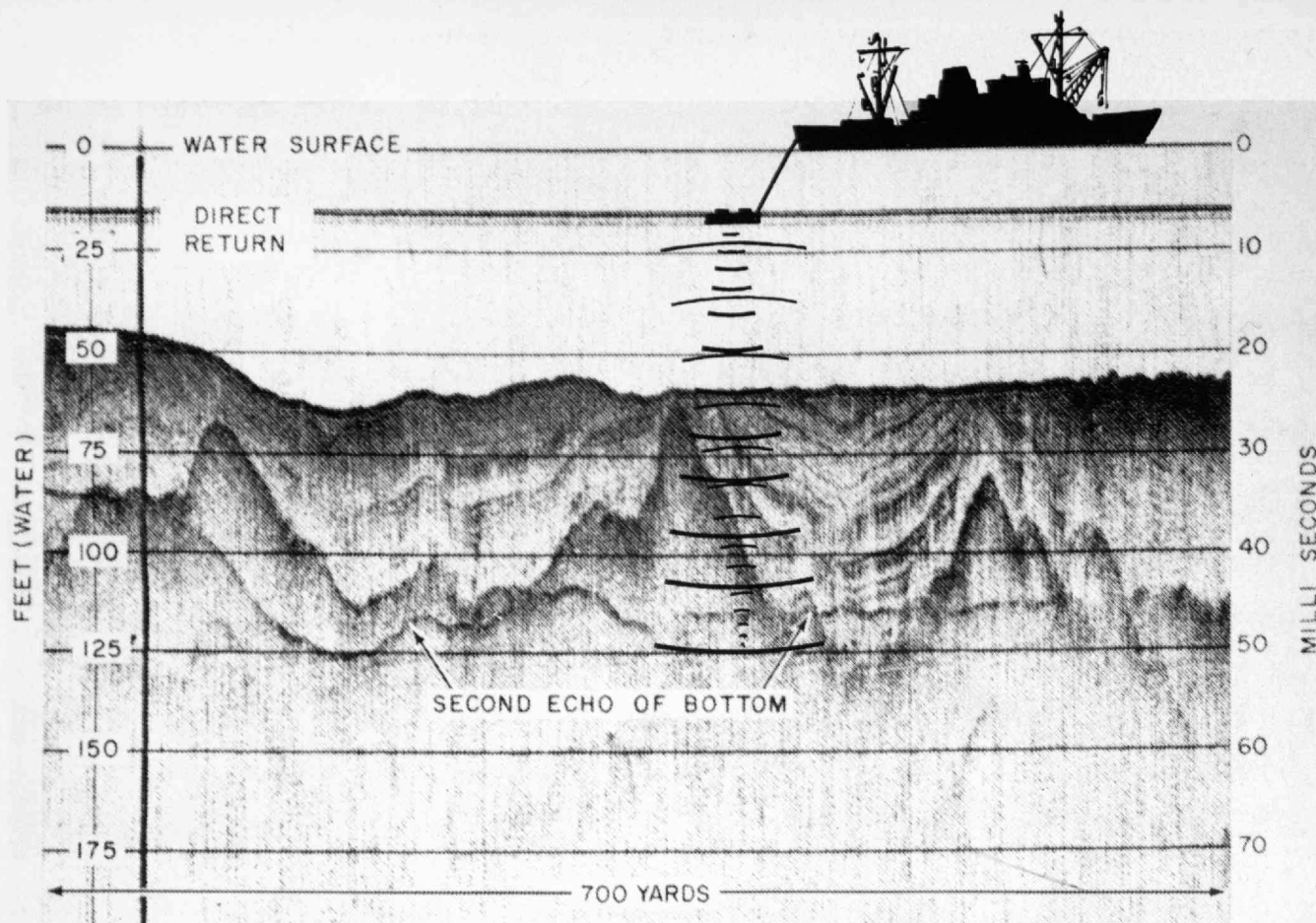
Technology Review

2000 THE NATURAL SCIENCES IN THE YEAR 2000

technology review

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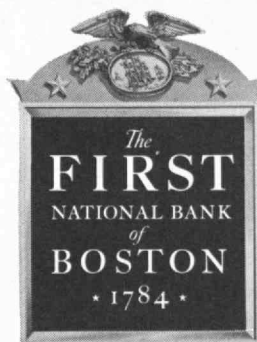
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The contributors and their topics:

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Charles Abrams—Housing policy
Thomas Pettigrew—Race relations
Edward P. Eichler—New communities
Lowdon Wingo, Jr.—Developing cities in the developing world
Norman Beckman—Governmental reorganization
Britton Harris—The problems of planning itself.

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Malnutrition, Learning, and Behavior

edited by Kevin S. Scrimshaw
and John E. Gordon

Two-thirds of the world's children suffer from protein deficiency, a disease of massive proportions recognized not only in underdeveloped countries but also in the urban slums and rural poverty areas of industrialized nations. The major concern of this book is the extent to which children with physical growth retardation also exhibit impaired learning and behavioral characteristics. These papers by leaders in the fields of pediatrics, the biological sciences, genetics, sociology, anthropology, psychology, and nutrition should concern anyone who desires to raise the quality of human life throughout the world.

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Perceptrons:

A Theory of Parallel
Geometric Computation
by Marvin L. Minsky
and Seymour Papert

It is the authors' view that although the time is not yet ripe for developing a really general theory of automata and computation, it is now possible and desirable to move more explicitly in this direction. This can be done by studying in an extremely thorough way well-chosen particular situations that embody the basic concepts. This is the aim of the present book, which seeks general results from the close study of abstract versions of devices known as perceptrons. A perceptron is a parallel computer containing a number of readers that scan a field independently and simultaneously, and it makes decisions by linearly combining the local and partial data gathered, weighing the evidence and deciding if events fit a given "pattern," abstract or geometric.

\$10.00

Single-Cell Protein

edited by Richard I. Mateles
and Steven R. Tannenbaum

The use of single-cell protein is a promising answer to the problem of developing low-cost protein sources for alleviation of protein malnutrition. This volume brings together for the first time a great deal of research pertinent to the present and projected use of single-cell protein as a food or food supplement, and includes discussions on the social, political, and psychological impact the development of such a food source would have.

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Molecular Spectroscopy with Neutrons

by H. Boutin and Sidney Yip

The primary purpose of this work is to describe the use of neutron scattering in the study of molecular solids and liquids. The development of the material is such that it is accessible not only to those already working with neutrons as a tool in molecular research, but also to optical spectroscopists and those in related fields.

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Abstract Syntax and Latin Complementization

by Robin T. Lakoff

This monograph, developed from the point of view of modern transformational theory, examines Latin complement types and demonstrates that for part of the grammar of Latin the syntactic rules for postulating deep structures are similar to those of English, that, contrary to the view of traditional philologists expressed over the past two centuries, Latin and English do *not* differ greatly in their complement systems regardless of their superficial structural differences. The book also investigates the relation of Latin to the Romance languages (which it influenced) and to Greek (from which it borrowed).

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The Internal-Combustion Engine in Theory and Practice, Vol. II.

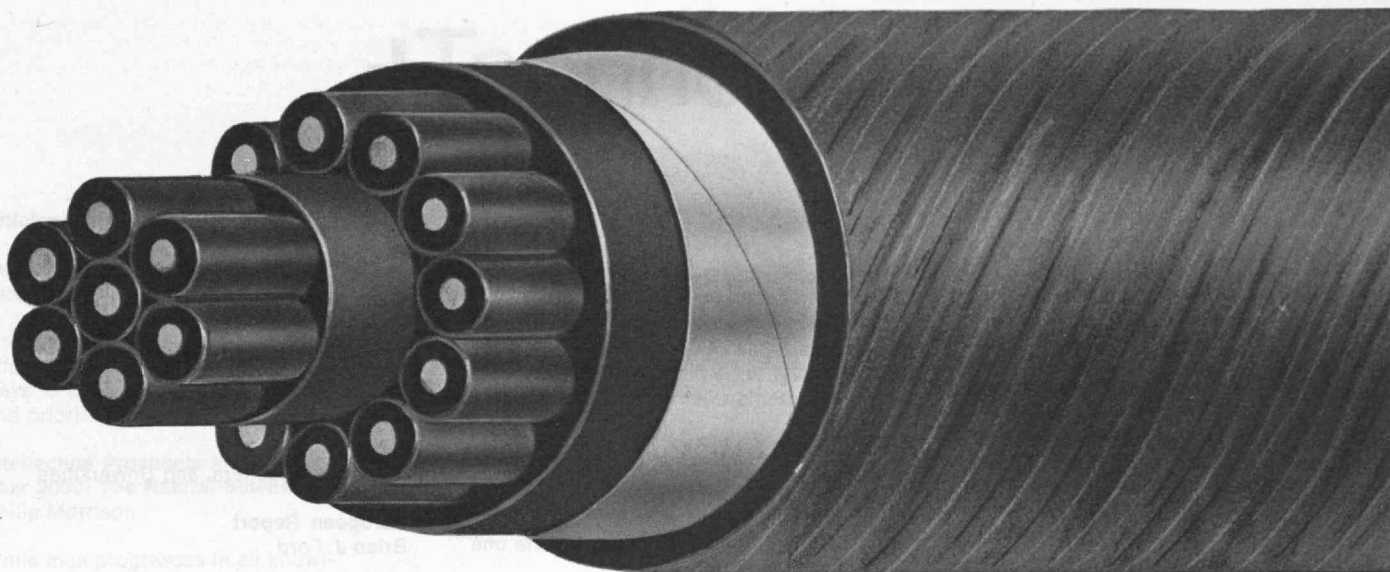
by C. Fayette Taylor

While Volume I covered the thermodynamics, fluid-flow, and performance of internal-combustion engines, the present volume deals in depth with engine design, carburetion and fuel-injection systems, combustion and detonation in spark-ignition and Diesel engines. Specifications of current passenger-car, truck and bus, automotive and locomotive Diesel, industrial, marine, and aircraft engines are given in a series of detailed tables. Fuels and engine materials are discussed in relation to effectiveness, life, and cost. An exhaustive bibliography, consisting of 125 pages of references, covers the entire field.

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Next Month

In *Technology Review* for February, 1969:

Technological responses to urban needs
are the focus of *Technology Review* for
February, to be published January 27.
The contents will include:

Industrial Technology and Urban Affairs,
by Mason Haire—how can we account
for the anomaly of a swiftly advancing
technology ensnared in archaic urban
systems, and how can we bring the one
to bear on the other?

Automated Highways, by Siegfried
M. Breuning—how automated control
can replace human control to the profit of
traffic-weary Americans.

Technology and the Solid Waste Prob-
lem, by David G. Wilson—the sophisti-
cated ways in which we could handle
solid waste, and what may happen when
we do.

Also in the February Review:
Weather Modification and the Biosphere,
by Frederick Sargent, 2d—though man
now contemplates changing the earth's
weather and even its climate, he knows
little of what his success may bring.

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Intellectual Prospects for the Year 2000: The Natural Sciences 18 Philip Morrison

While man progresses in all knowledge of himself and his world, the ecumenical spirit of true science will be the yardstick of his achievement.

Scientists and Students in Europe: A Report from Prague and Paris 24 Bernard T. Feld

"There are many permanent values in the life of men which cannot be expressed in terms of money: . . . love, bread, fantasy, and also, it is said, art."

The Car Is Here to Stay: Emerging Patterns of Urban Transport 32 Alexander Ganz

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People Rationing

It's a far-out notion, but maybe we should explore the possibility of rationing the number of people who live in any area.

Professor James E. Etzel of Purdue University raises the question because, as a sanitary engineer, he's running up against the elemental fact that an organism can't go on living surrounded by an increasing volume of its own wastes. His suggestion underscores the conviction of many experts concerned with environment—that men need to take a penetrating new look at themselves and how they live on their increasingly crowded planet. They need to think in terms of the quality of life they want to live and not just in terms of piecemeal solutions to pressing problems.

Pollution Is Man Himself

When it comes to pollution, for example, it's not enough to try cleaning up the air or purifying the rivers. This just adds to the fast-growing mass of solid wastes which our cities already have trouble getting rid of.

Discussing this with a group of science writers recently, Dr. Etzel noted that Chicago sewage treatment now gives rise to about 1,000 tons of solid wastes a day. Cleaning up Chicago air and water would boost that to 4,000 tons a day. And the debris from the elaborate packaging and other accouterments of the consumer economy increasingly swell the volume.

If you burn the solids you pollute the air. If you dump them in the rivers or sea, you pollute the water. And you can't turn the countryside into a dump. The truth is, Dr. Etzel says, that we're running out of places to hide the stuff. One partial solution might be to grind it all up with a kind of supergarbage grinder in every home. Then, transported by sewers, the grindings could be disinfected and prepared as a compost which could be spread over land.

Instead of turning that land into a dump, the compost would enrich it. The material could be used for fill, too. And, for mineral-short future generations, it would be a potential source of recoverable metals. For Dr. Etzel would grind up everything—including metals (watch that silverware when you wash up).

While this could be expensive, there would be substantial savings to offset the costs of such a novel waste-disposal system. A study in which Dr. Etzel shared found that some two-thirds of today's disposal money goes for collecting the trash in the first place. Grinding it up and sending it through the sewers would mean a big saving on the collection end.

Dr. Etzel outlined this scheme as an example of how imaginative use of technology can do a lot to help clean up the environment. But it does have its limits. In the end, he said, we have to recognize that pollution is man—man and his industries, his transportation, his mode of living. Man has to learn to control himself if he is to control pollution. That's where the people rationing fits.

Dr. Etzel explained that a given region has a carrying capacity for people that's determined by such things as its natural features, the economics of waste control, and peoples' concept of what is a desirable standard for their environment. Put this together in a careful study and you probably could come up with a number. We may be reaching a point where it would be more beneficial to limit population to a region's carrying capacity, and to plan the regional development for this instead of letting things go on growing in the *laissez-faire* fashion of the past.

Dr. Etzel tossed out this notion during the Sixth Annual Briefing on New Horizons in Science sponsored by The Council for the Advancement of Science Writing and co-sponsored by Northwestern University. Comments by two other scientists pointed up this need for new vision on how we inhabit our planet.

The Implications of Chemicals

Howard E. Johnson of Michigan State University thinks that our general unconcern for the buildup of low levels of pesticides throughout our environment may be foolhardy. He's not worried about massive fish kills or other pesticide catastrophies. He said that accidents and gross mishandling of poisons is coming under more effective control. But what about the general runoff of DDT and other chemicals into streams, lakes, and the sea, or the spread of small

amounts of deadly powders by the winds? Right now these contaminants come as much from our flea powders, garden sprays, and household chemicals as from the pesticides on the farms.

No one knows very much about the long-term effects of this chemical back-ground. But there are enough hints, in Dr. Johnson's judgment, to warrant far more caution than we use. He illustrated this with studies he has made on Great Lakes salmon.

Adult fish may put up with certain amounts of pesticide (DDT, say) in their water only to spawn offspring that soon die. It turns out that the DDT passed on to the eggs concentrates in an oil globule in the yolk. The fry swim around for awhile with the yolk sac attached, drawing nourishment from it. About the time they are ready to switch over to regular feeding, they absorb all of the yolk including the oil globule. Then the pesticide hits them. Adult fish that appear unaffected by minute amounts of pesticide in the water may lose 80 to 100 per cent of their fry.

The effect depends partly on the poison concentration in the water. But no matter how low it is, long enough exposure of the adults will harm the young fish. In one test, fish exposed to three parts DDT per billion for three weeks before spawning lost all of their fry.

So far, catastrophies of this magnitude haven't been found in nature. But some Lake Michigan fry show mortalities of 15 to 50 per cent. This compares to mortalities of about 1 per cent for Lake Superior fish and fish brought in from Oregon. Dr. Johnson suspects poison. He also suspects it underlies losses of about 11 per cent in the hatcheries.

While no one likes such losses, Dr. Johnson is more concerned with the broad implications of his study. It points up how minute quantities of poison may cause trouble in devious ways. Aren't indications such as this enough to put man on guard against the easy assumption that chemical control of pests is in itself a good thing?

In Dr. Johnson's view, reliance on chemi-

"Perhaps our first order of business should be to decide what quality of environment we want. Then we rationally can adapt such programs as pollution control, city planning, or regional development to that overriding goal. Seen in these terms, . . . people rationing may not be so far out after all."



icals is a dangerous long-term strategy. Pests, he says, are biological and we have to take their biological nature into account in trying to control them. This may mean new techniques of agriculture to reduce the need for poisons. It may mean very strict regulation of the chemicals themselves, especially when used in gardens and around the house. Dr. Johnson would go so far as to require pesticides to be sold under prescription with tight procedures to account for their use and disposal.

Certainly, warnings such as he and other wildlife biologists have given suggest we are going at the pest-control problem from the wrong end. Usually our first thought is to get after the pest, and chemicals often seem the best way of doing it. Perhaps instead we should ask ourselves what kind of environment we want to maintain—one free of pesticides or one with ubiquitous—albeit minute—traces of poisons? The answer to the question would then help determine our pest-control strategy. Dr. Johnson may well be right when he says that chemical pest control should be an interim thing, a step toward less toxic means. Certainly, we badly need large-scale research to enable us to know what we are doing to our environment.

Neither Poison, Trap, nor Family Cat

To consider yet another problem we've been looking at the wrong way around, there are the rats in our cities. Dr. David E. Davis of North Carolina State University told the science writers the only effective way to get rid of them is to make those cities better places for people to live. He's worked with the problem for over two decades and realizes that neither poisoning, trapping, nor the family cat can do the job.

The reason lies in the biology and sociology of rats. Their populations follow a growth curve in which numbers at least partially control reproduction. Rats multiply rapidly when they have lots of food and nesting places. But as their numbers approach the limits of these amenities, their population stabilizes. Dr. Davis explained that the stresses of increased competition inhibit reproduction. It's not a matter of some rats moving out.

The stress stimulates release of certain hormones. These both slow down reproduction and lower disease resistance. At the same time, crowding exposes more rats to the dangers of dogs, cats, and traps.

The trouble with poisoning rats is that you just cut their populations to a point where there is plenty of food and living space. As soon as you let up the attack, the population rebounds. Clean up the garbage, rehabilitate a neighborhood, and the food and nesting sites disappear. This will drive a rat population down to zero. And it can be kept at zero with a modest maintenance program and high sanitary standards.

We have to deal with rats as a population, not as local pests which we can control by removing individuals, Dr. Davis says. This is a biological fact and we have to face it. But we can take advantage of the correlative fact that, by altering the environment, one species will prosper while another fades out. Our goal really should be to make our cities healthy environments for people. This would automatically get rid of the rats.

Pollution, pesticide contamination, rats—these are typical symptoms of a deteriorating environment. As problems they cry out for solution. Yet trying to solve them individually may not get us very far. The way we tackle them, in each case, comes back to our attitude toward the environment itself.

Perhaps our first order of business should be to decide what quality of environment we want. Then we rationally can adapt such programs as pollution control, city planning, or regional development to that overriding goal. Seen in these terms, Dr. Etzel's notion of people rationing may not be so far out after all.

Robert C. Cowen is Science Editor of The Christian Science Monitor. He holds degrees in meteorology from M.I.T., and he is a Past President of the National Association of Science Writers.

Students, Teachers, and Universities

"The world seems to be full, today, of embattled students."

—George F. Kennan in *Democracy and the Student Left* (New York: Atlantic-Little, Brown, 239 pp., \$5.75)

"... one of the causes of the April disturbances [at Columbia University] was the failure of the academic community to ... build a firm consensus of moral opinion concerning the limits upon morally acceptable methods of expressing dissent."

—Cox Commission Report, *Crisis at Columbia* (New York: Vintage, 222 pp., Paper, \$1.95)

"To them (the press and others), minority action in seizing buildings constituted an absolute crime. . . . Whoever measured the violence done the victims of Columbia policies? How can you weigh that violence against the act of seizing a few buildings? Depriving a few individuals of their 'right' to an education (i.e., 'I paid my \$1,900') is certainly a lesser evil than allowing Columbia to continue its policies."

—Mark Rudd, Chairman of the Columbia chapter of Students for a Democratic Society, quoted in *Jerry L. Avorn and members of the staff of the Columbia Daily Spectator in Up Against the Ivy Wall* (New York: Atheneum, 307 pp., Paper, \$3.25)

"This is the ultimate practical question which civil disobedience poses. Peoples' consciences differ. If everyone thinks that strong convictions, sincerely held, are enough to justify breaking the law, we accept violence as the only arbiter, and it is the violence . . . of lynchers and mobs."

—Charles Frankel in *Education and the Barricades* (New York: Norton, 90 pp., \$3.95)

As if by design, these books construct around the recent events on campuses across the country an illuminating, dramatic framework: prologue, the action, epilogue.

Prologue

Mr. Kennan, distinguished analyst and shaper of foreign policy, dedicating a new library at Swarthmore College, gave a talk which was published in January, 1968, in *The New York Times Magazine* under the title, "Rebels Without a Program." Mr. Kennan's book contains the original article, some of the unprecedented number of letters it elicited, and a 100-page essay written in response. Twenty-eight of the letters are from students in colleges and universities, including M.I.T., and 11 are designated "from the older generation," including one from a woman who tells us she is 31. It appears that the razor's edge remains where it been been.

In view of the sophistication of style and reasoning in his writings on foreign policy, it is surprising to find in this book inexactness of language (Does he really mean that people must choose between order and justice?), pre-Freudian innocence about parent-child relationships (Hippies prattle about love, but "just the cruelty to parents alone, which is implicit in much of [their] behavior, is destructive of the purest and most creative form of love that does exist . . ."), and political naivete (The C.I.A. was doing a number of "highly useful and constructive things . . . for the simple and innocent reason that our government structure had . . . no federal ministry of culture to handle matters of that sort.").

The letter writers find it easy to take issue with him on many points: the obligation of rebels to present alternatives to the society they wish to overthrow; New Left tactics, which he describes as "violence for violence' sake"; black power; student power. Their major disagreement concerns his expression of "a serious doubt whether civil disobedience has any place in a democratic society." In his longer essay he admits that he "dealt with this subject . . . much too cavalierly," but a re-examination leads to no substantial change in his position.

The qualities that make us wince, even in agreeing with Mr. Kennan, should not prevent us from appreciating his insights. He notes, for example, the lack of humor and the joylessness of the rebels. On a more serious level, he tells his critics: "Several years of residence in both Hitler's Germany and Stalin's Russia qualify me, I think, to say that whoever speaks of the United States government of 1968 as a *totalitarian* government does not know what the word 'totalitarian' means."

The writers of the letters are probably neither hippies nor political activists, but almost all, regardless of age, appear to be "fellow travelers," as Mr. Kennan is a "fellow traveler" of the Establishment. Surely, then, the book must be filled with stimulating exchanges between verbal, uninhibited people of strong opinions. It is not so. Nothing is exchanged across the invisible barrier. The writers of the letters do not see or hear George F. Kennan. They see the power structure, knowing as an article of faith that between them words can only be weapons. Mr. Kennan fails to understand what they are saying, not because the cliches (alienation, confrontation, participatory democracy) in which they communicate with each other are meaningless to him. He simply does not understand what they want.

The theme is foreshadowed. The prologue is ended.

The Action

In the spring of 1968, students at Columbia University, as at many other institutions, were concerned about the war in Vietnam, the draft, civil rights and University relations with the black community, and the grievances of black students. Two specific issues became symbols of these broad concerns. The first was Columbia's affiliation with the Institute for Defense Analyses, which serves the Department of Defense as adviser on weapons and warfare. The second was the planned construction, on a hillside in Morningside Park that sloped from the University of the heights down to Harlem below, of a new gymnasium, a separate section of which would be available to the community. Around these issues, Students for a

Europe and the Great American Cities

Democratic Society and Students Afro-American Society had for two years organized protests against what they considered Columbia's support of the war and its racist policies.

On April 23, S.D.S., joined by S.A.S., called a demonstration to be held at the Sundial in the center of the campus. Before the day was over, groups of students—eventually numbering close to 1000—had occupied five University buildings and held the Dean of Columbia College hostage. After six days, the University administration called in the New York City police, more than 1000 of whom took the occupied, barricaded buildings, arresting 712 students; 148 were injured.

A student strike followed. Then, on May 21, students reoccupied a college building in protest against the disciplining of four S.D.S. leaders. The police were again called to empty the building and clear the campus.

That June, Class Day was canceled and commencement exercises were held indoors, although it was a fine, sunny day. Grayson Kirk did not deliver the commencement address, as was traditional. In August, he announced his early retirement as President of Columbia University.

The bare scenario vibrates with dramatic tension, but it remains only a plot outline without the essential details. What was happening, from hour to hour in a dozen places, what decisions were made and changed, what actions were undertaken and abandoned, what leaders arose and were deposed, how did 1000 young people live during those six days, what did they think and feel?

All the extra dimensions, human and spatial, are in *Crisis at Columbia* and *Up Against the Ivy Wall*.

The first is the report of the Commission, under the chairmanship of Archibald Cox, Professor of Law at Harvard University, appointed by the Columbia Trustees at the request of the newly formed Executive Committee of the Faculties. The Commission was to direct its attention to the chronology of events

and the underlying causes of the disturbances. The investigation was conducted mainly through formal testimony at public hearings. Only the Strike Coordinating Committee and the black students who occupied one of the buildings boycotted the hearings.

Up Against the Ivy Wall is based on firsthand observations by reporters covering events as they took place. As staff members of the student newspaper, the authors had special privileges, moving in and out of occupied buildings and attending meetings of faculty groups. Their story, enlivened by photographs, is told at length in a style more vivid, though not less serious, than the cautious, legalistic language of the Cox Report.

Both versions agree that the University administration was guilty of serious errors. The President, the Provost, and the Deans failed to distinguish between a small number of "hardcore revolutionists" and "the great body of students genuinely concerned with improving the University" (Cox). In fact, the Commission states, by the final days the "grievances of the rebels were felt equally by . . . probably a majority of the students." The administration underestimated the number of students in the occupied buildings, so that the police force dispatched was inadequate. This was a contributing factor in the use of excess force in clearing the buildings.

Underlying all the actions of the administration was the fear of uncontrolled violence that might have erupted at any moment from two sources: a clash between the demonstrators and students opposed to the demonstrations, of whom there were a large number loosely organized in the Majority Coalition; and large-scale support for black students from the Harlem community at the edge of the campus.

The tactics of the demonstrators, both before and during the seizure of University buildings, rested on manipulation of this fear. All observers agree that if police action had been requested on April 23, when the first building was occupied, the "revolt" would have ended that day. The *ad hoc* Faculty Group re-

peatedly warned the administration that involving the police risked unleashing the expected violence from one or both sources and asked for more time for talking with the students. The S.D.S. leadership engaged in "negotiations" with A.H.F.G., prolonging them for days with no intention of striving for agreement, as the speeches and manifestos quoted in *Up Against the Ivy Wall* reveal.

Aside from reporters of the *Spectator* and the campus radio station, WKCR, the only individuals in the University who moved freely among the students during the demonstrations and in the occupied buildings were faculty members. They mediated between antagonistic groups of students, averting potentially serious conflict. With white handkerchiefs as emblems on their sleeves, they stood in solid lines between their students and the police.

It was clear, as the action ended early in June, that the faculty had gained honor and stature.

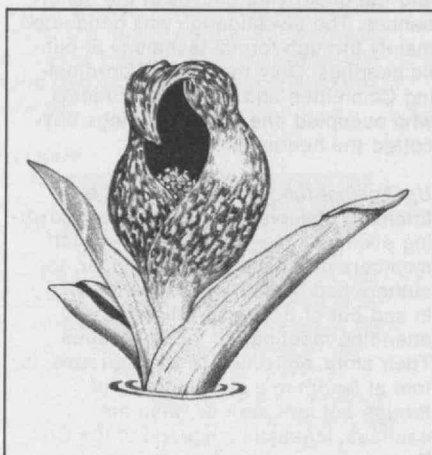
Epilogue

At the end, it is natural to ask for explanations. But whether the causes of revolt are found in imperatives stemming from personality or sociology or politics, they are hardly useful in understanding the past or acting in the present.

The authors of *Up Against the Ivy Wall* provide a description, not an explanation, of the events at Columbia that closes the loop, returning to the opening theme: "Each side viewed the University as a miniature version of full-scale national revolution. Just as the administrators saw themselves as the representatives of law and order, the student leaders often cast themselves as the vanguard of impending global insurrection. There was some truth to both perspectives. . . . But when this analysis was exaggerated—as it was by both sides . . . its only result was highly principled stubbornness in each camp."

Professor Charles Frankel, a philosopher, returns to Columbia after serving as Assistant Secretary of State for Education and Cultural Affairs. In *Education and the Barricades*, he is concerned not with the events at Columbia, but with the

"The four seasons have no end and no beginning. . . . It is a play that never ends. It is full of life and beauty. But most of all, it is full of surprises."—Henry B. Kane in *Four Seasons in the Woods* (illustrations, below, by the author). New York: Alfred A. Knopf, 1968.



"state of disarray of the higher educational community," which requires attention to general principles.

To a philosopher this means asking questions. Do the principles of democracy apply to higher education? Do students have a right to demand power? Are illegal tactics ever permissible?

His answers, though hardly more than suggestions in so short a book, are penetrating, particularly in his discussion of civil disobedience.

Professor Frankel's answers often end in other questions—which is a way of turning an epilogue into a new prologue.

New from the M.I.T. Community

Project Romulus: An Adaptable High-Density Urban Prototype, Anthony Kettaneh, '69, Editor. Cambridge and London: The M.I.T. Press, \$7.50. The report of an interdepartmental student project in systems engineering conducted at M.I.T. during the spring term, 1967—a plan utilizing advanced technology for accommodating 100,000 people in a new city on one square mile of land in Boston Harbor (see *Technology Review*, Jan., 1968, pp. 44-45).

Rabelais and His World, Mikhail Bakhtin, translated from the Russian by Helene Iswolsky. Cambridge and London: The M.I.T. Press, \$15. A new critical study removing Rabelais from within the main-

stream of great French literature and viewing his work as a continuation and consummation of a rich and varied history of folk humor.

The Man of Many Qualities: A Legacy of the I Ching, R. G. H. Siu. Cambridge and London: The M.I.T. Press, \$6.95. A critical essay on a 3000-year-old Chinese classic which has served for centuries as a principal Chinese guide on how to govern a country, organize an enterprise, deal with people, and contemplate the future. "Is not *I Ching* the perfect book?" wrote Confucius nearly 2500 years ago.

Information Theory and Reliable Communication, Robert G. Gallager, Professor of Electrical Engineering, M.I.T. New York: John Wiley and Sons, Inc., \$15.95. A full treatment of information theory and coding techniques which ranges from basic ideas and theoretical applications to topics of current research interest.

Algebraic Coding Theory, Elwyn R. Berlekamp (M.I.T. '62). New York: McGraw Hill Book Company. A book on constructive coding theory which presents the best error-corrected codes that have been proposed and an exposition of decoding algorithms.

Introduction to Combinatorial Mathematics, Chung L. Liu, Associate Professor of Electrical Engineering, M.I.T. New York: McGraw Hill Book Company. An introductory treatment of

combinatorial mathematics, intended as a textbook for students in engineering.

A Primer on the Economic History of Europe, Paul Hohenberg. New York: Random House, \$2.95 (paper). An effort to bring the longer perspective of European history to bear on the problem of economic growth; now at Cornell University, Dr. Hohenberg holds the Ph.D. in economics from M.I.T.

Nuclear Power Plant Design, Harry A. Kuljian (M.I.T. '19). New York: A. S. Barnes and Company, \$30. Basic principles of nuclear fission, general aspects of reactor design and operation, and the basic design calculations and features of each of the various types of nuclear power plants. Planned for engineers with practical knowledge of conventional thermal power plant design but who are unfamiliar with nuclear reactor system engineering.

Money in Printing, John W. Rockefeller, Jr. (M.I.T. '20). Denville, N.J.: Modern Lithography, \$10. An autobiographical essay on recent, present and future developments in the printing industry drawn from the author's experience as a consultant for over 35 years.

The Collected Works of Count Rumford—Volume 1; The Nature of Heat, edited by Sanborn C. Brown, Ph.D. '44, Professor of Physics and Associate Dean of the Graduate School, M.I.T. Cambridge: Harvard University Press. A new presentation of the materials originally published by the American Academy of Arts and Sciences late in the Nineteenth Century, with papers rearranged according to subject matter. The series is planned to reflect the scientific, political, and social conditions of Count Rumford's time—the industrial revolution—as well as to record Sir Benjamin Thompson's own scientific contributions.

Joseph Mindel is a member of the M.I.T. Lincoln Laboratory. (The notes "New from the M.I.T. Community" have been prepared by the editors of *Technology Review*.)

Europe and the Great Science Muddle

I think I can consider myself lucky: now, at the ripe age of 29, I can look back on over 500 scientific publications in a whole range of disciplines. My, you must be thinking, what a fortunate man to work in such a strident, stimulating academic community; but it is not so simple. I was lucky. For, instead of working within the framework of orthodoxy, I have worked independently from my own laboratories—a situation which ought to result, at best, in a rather tawdry imitation of high-pressure pure research in the college environment but which, in England and indeed in Europe at present, is probably the best way to do original work.

The science scene in England is stagnant. It has entered a gloomy introspective phase of myopic indifference, and the efforts we are seeing at present are likely to do little to mitigate what is, by any assessment, an anachronistic situation.

Tackling the Problem Backwards

It was in 1964 that Harold Wilson became Prime Minister of England, largely on the strength of an electioneering speech in the previous year's congress when he spoke passionately, one might say mellifluously, on the importance of a white-hot revolution of new science-based industries, and a renewed appraisal of the importance of science to society. It was, he claimed, the birth of a technological era.

The labor, to put it politely, has had a remarkably protracted third stage. In the opinions of many English authorities, the era has been stillborn and disposed of whilst our backs were turned. Recently there has been a spate of reports and investigations into the place of the scientist in modern British civilization, but none has really bitten to the core of this most recalcitrant of problems.

The Dainton Committee, whose findings were published earlier in 1968, was concerned with the swing away from science in schools and colleges. It condemned premature and irrevocable specialization in science-education, and suggested ways in which science could become a little more rationalized in relation to the schools. The Jones Committee studied the 'brain drain' and at-

tempted to suggest ways which (reinforced by current U.S. immigration law reform) would be instrumental in plugging the leak of graduates away from Britain and into the receptive and amenable environments of American research. The Swann Report—which has only just been published—has indicated a need for a vast increase in the number of technologists in the English economy. (See *Technology Review, Dec., 1968, p. 12.*)

This is, surely, tackling the problem backwards. There would appear to be remarkably little justification for a marked increase in production of members of a profession which is, at present, already underused. There is a common feeling in England that we have too few scientists: but the experiences of the scientists themselves belie the suggestion. They find, for instance, that rates of pay are low and that the competition for employment is very severe. One of my closest fellow-students is presently carrying out research in cytogenetics at a leading medical research unit in Glamorgan. He is 29, has good honors B.Sc. and a Ph.D.—six years of university training—and works for perhaps 60 or 70 hours per week. He takes home roughly \$46 per week, a scandalous total even by British standards, and very much less than a laborer relies on (working men may earn between \$120 and \$160—often considerably more with overtime). Recently he applied for a job as a university research assistant; the annual pay was \$3200 and yet (in contradiction to the teaching that we have a shortage of scientists) he found over 60 other applicants had put in for the post—all men with good degrees and in their late twenties. The situation, I hasten to add, is fairly representative.

The difficulty is not one of supply-and-demand, but is a matter of frustrating conditions in education and beyond. In earlier essays I have posed the concept of the "qualification gap"—that is the disparity between the criteria of educational selection for a profession and the qualities needed by the graduate in practice—and this underlies much of our present discontent. Although the graduate research scientist needs qualities such as heterodox independence and original creativity, he is trained to become a servile, conformist memorizer of data;

his creativity is stifled and the chances for original constructive research are denied him for far too long.

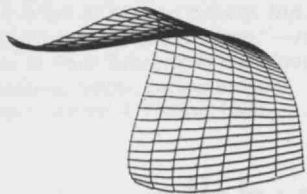
A Tradition of Neglect

A similar position obtains also in Europe. Recently I spent some time in Brussels and Luxembourg for talks with officials in Euratom, the Common Market's atomic research authority. Here too they found that the appreciation of science at government level was slight; the financial allocation, which was felt to be miserly, had not materialized at the time we were talking and the scientists felt aggrieved that they thus were being neglected.

My meetings did confirm, however, that the fervor which is found behind the scenes for Britain to join the European Economic Community is largely based on the English technological superiority over the other European countries. Certainly the British expertise in, for example, computer technology or nuclear power stations, is very much superior to the continental; but the British have almost a tradition for neglect of important scientific advances. The first antibiotic, penicillin, was a British discovery—but it was only after 12 or more years of wrangling that any backing was given to the development of the material, and then it was American capital that enabled the antibiotic to become a practical reality. The latest British innovation, the air-cushion hovercraft, is fighting against official apathy—and the hovercraft's inventor, Christopher Cockerill, has been "retired" whilst the government-backed companies quibble.

It is not good enough to insist that "we need more scientists." We ought to use scientists better, our training should be reorganized and rationalized from top to bottom, and the opportunities should become more realistic. Then we will begin to appreciate scientists and technologists a little more and the solution of our problems will be in sight. Meanwhile, simply creating a vast new pool of unwanted, unappreciated specialists will only worsen an already bizarre situation.

Mr. Ford is an English editor, scientist and lecturer who describes himself as a staunch controversialist on British television.



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"We need a commitment to an aggressive, vital scientific program, a rededication motivated by the true need of our society, the need to be continuously inventing our future, if we are to remain a vital nation."



The disarray of America's scientific effort emphasizes our need for new ways to focus on national problems and priorities

Jerome B. Wiesner
Provost of M.I.T.

Rethinking Our Scientific Objectives

We have many problems in our society—poverty, hunger, deterioration of cities, pollution of air and water, threats of war—and for each of these we see possibilities for great gains from technological knowledge. However, if we ask how well we are doing, how fast we are progressing toward solution of these most difficult problems, or even if we ask how effectively we are using our scientific and technological resources in the search for solutions to these problems, we are not very pleased with the answers. This does not mean that one cannot find a great deal of exciting research and development; it means, rather, that there are some very serious gaps in the programs and that we have not learned how to bring our great resources to bear on these problems effectively.

Some important areas have never been properly managed or supported. In this category particularly are applied programs directed at solving our great social problems and the basic research activities designed to support them. In this category, too, I would include research in individual and group behavior—the behavioral sciences—and the social sciences, research related to the environment and research activities related to the urban setting.

The Growing Gap Between Deeds and Needs

The reasons for supporting scientific activities have been repeated so often that they have begun to sound like clichés. Yet they bear repeating, for one cannot escape the fact that a continued high level of research and development is essential for many vital national purposes.

The achievement of new technologies in the natural and social sciences depends upon a continuing flow of new knowledge and of large numbers of young, well-educated research scientists, engineers and technologists; and from these will also come the basis for large new industries that will employ our growing population and enrich our economy.

Without basic science and technology, we will not solve the innumerable national and international

problems which challenge our well-being and the peace of the world. The rapid solution of the urgent problems of urban and community redevelopment, mass transportation, the creation of new industry, the implementation of effective disarmament—these all require highly technical information. Effective population control, food production, maintenance and improvement of health, elimination of air and water pollution—problems which threaten our very existence—demand the broad application of biological and chemical skills.

Even though for the moment the military technologies have matured, it is clearly prudent to maintain a strong military research and development program. Such a program will ensure that we are not suddenly confronted by a decisive new technology in the hands of a potential enemy, and the knowledge it provides will be the only basis on which to judge someone else's claims of a new military development. Only because of our own efforts to develop an effective anti-ballistic missile defense system are we in a position to make a reasonable evaluation of the Soviet system—an evaluation, incidentally, that allows us to be quite certain that the Soviet system will be almost totally ineffective against the sophisticated American missiles. Unfortunately, the reaction to the lessening of suspicions and tensions between the United States and the Soviet Union has not been to stop the large-scale deployment of weapons; instead, the reaction has been to slow down the research effort to provide the basic knowledge which would make us strong in the future.

In the face of these continuing and indeed increasing needs, we have now to admit that our research and development effort is presently in real trouble. Indeed, it is probably not an overstatement to say that the scientific establishment of the nation is in a state of disarray. There has been no time in the post-World-War-II period when the situation looked as bleak, nor were our scientists more discouraged. Research budgets at universities and at most national centers are being drastically cut; a sub-

stantial number of the Federal fellowships which have played so important a part in the education of new scientists and engineers have been eliminated, and essential research facilities are being deferred.

Actions already taken will weaken the fabric of the American scientific establishment for many years to come. Many scientists fear that our leadership in important areas of basic and applied research is passing to Europe and Japan. This may now be happening in high-energy nuclear physics, in some areas of metallurgy, in some areas of solid state physics, in astronomy, and in specialized instrumentation fields such as high-resolution electron microscopy. If it continues, this attrition in the American leadership of science and technology will have disastrous effects on our entire society.

Needed: A Sound Strategy for Science

Are these difficulties merely a reflection of Federal fiscal problems which will pass if the Vietnam war is ended? I think not. I believe that the problem is more basic.

The scientific establishment of the country is facing these severe, unsettling effects as a result of changing national interests as well as the mounting government expenditures arising from the Vietnam war and the crisis in the cities. The difficulty has been made even more acute by a growing unwillingness on the part of some members of Congress to support university-based research through the Department of Defense. This situation exists because some legislators have used cuts in research budgets as a way of expressing their resentment of antiwar attitudes prevalent on many campuses; and, ironically, because other legislators have advocated reductions because they fear that defense money corrupts the universities.

Unfortunately, the impact of the anti-university and anti-science sentiment in the Congress is not restricted to programs sponsored by the Department of Defense. The National Science Foundation, the National Institutes of Health, the Atomic Energy Commission, and the National Aeronautics and Space Administration, as well as many other agencies that sponsor research and development activities, have had their research support cut more severely than other parts of their budgets. The nation, for example, is planning to spend an additional \$20 billion on highway programs while \$300 million is being squeezed out for research support.

Much of this difficulty arises, I believe, because we do not have a sound strategy for science. Most of the research and development support of the past 20 years has been based on Cold War incentives—that is, on military requirements and the space race. Less than \$2 billion of the approxi-

mately \$15 billion spent on research and development in 1967 was undertaken to support goals other than military and space, and more than half of this remainder was for health-related activities.

It has been our nation's good fortune that most of the fundamental research supported for security and space reasons was generally useful. Even most of the exploratory research and some of the specific equipment developments undertaken for these special reasons have had a much more general utility. The transistor, the high-speed computer, the jet aircraft and the communication satellite are but four of many examples of developments that evolved from defense or space work.

But this pattern of support has nevertheless resulted in a seriously lopsided research program. For example, the fields of chemistry and the social sciences have been regularly underfunded. The National Science Foundation, the agency that should have corrected these imbalances, has never been adequately supported. Those few federal programs that have been created to help, understand and cope with the great social and technological problems of our times are not well conceived or well managed. The pollution control program, for example, is too gadget-oriented and too short range; it lacks an adequate base of exploratory research on which to build a sounder effort. The programs oriented toward the many tough problems of the cities are similarly deficient. This difficulty arises, I suspect, because the agencies responsible for the related action programs are under great pressure for quick results. What is more, they, too, are underfunded, and they have no tradition of research support for guidance.

Regardless of the current mood and attitudes, progress toward a decent society in the future continues to depend upon a strong scientific program and its related educational activities, and so we must seek to remedy the present situation.

A New Focus for Affairs of Science

My conclusion is that, given the present antagonisms and the considerable skepticism about the value of a continued high level of research and development support, the only solution is to reorganize and strengthen the federal mechanisms for planning and supporting research and development.

In the past, those of us who have studied the problems of science policy have generally concluded that the more diffuse multi-agency arrangements currently employed serve the nation better than would a single department of science into which were consolidated all federal research and development activities. I still feel that a single agency

with the responsibility for all federal activities would be a poor arrangement. In fact, I believe that even the responsibility for all basic research should not be concentrated in a single agency. But given the present situation—one which I am certain will persist unless another major military confrontation develops—we must create more effective mechanisms for planning and managing the government's scientific activities.

There is today no effective process by which our nation can really focus on its problems and needs. There is no single entity of government with responsibility for planning and monitoring the broad range of research and development activities required to support the national goals. No wonder there is so little understanding of the purposes of the country's research efforts!

The Office of Science and Technology, which I once headed, attempts to identify and co-ordinate important areas of research and development and to give some balance to the national effort. It succeeds to a certain degree in this effort. But since it is not an operating agency, it can neither support the programs adequately before the Congress nor insure their quality after they are initiated. The National Academy of Sciences and the National Academy of Engineering have provided much of the long-range guidance that has been available for science planning, and this work has been of very great value. But it has been neither continuous enough nor broad enough in scope.

The most important single need in our nation is to develop a more rational process for forecasting social trends and for developing plans to deal with the problems and needs that are identified. While this process would include planning for research and development, it should extend considerably beyond this to indicate resource allocation for all public endeavors, including foreign aid and national security.

It would seem quite appropriate to use the National Science Foundation as the core for a new agency for planning research and development within this broad mandate. In addition to the Foundation's present responsibilities, this agency should be given a responsibility for basic and exploratory research in the environmental and urban areas, in education, and in other fields that are currently inadequately supported, paralleling the more mission-oriented activities now undertaken.

The new agency should be given a strong mandate to stress the development of the social and human sciences and the technology needed to do forecasting and resource allocation studies. It might also have the responsibility for developing an analysis

and forecasting system to support the executive and legislative branches of the government.

I would also consider as a possibility the transfer of responsibility for the support of higher education from the Office of Education to the new entity, so that one agency of the government would be concerned with all of the many aspects of federal assistance to universities, including facilities grants, support of special educational activities, student assistance and the sponsorship of academic research.

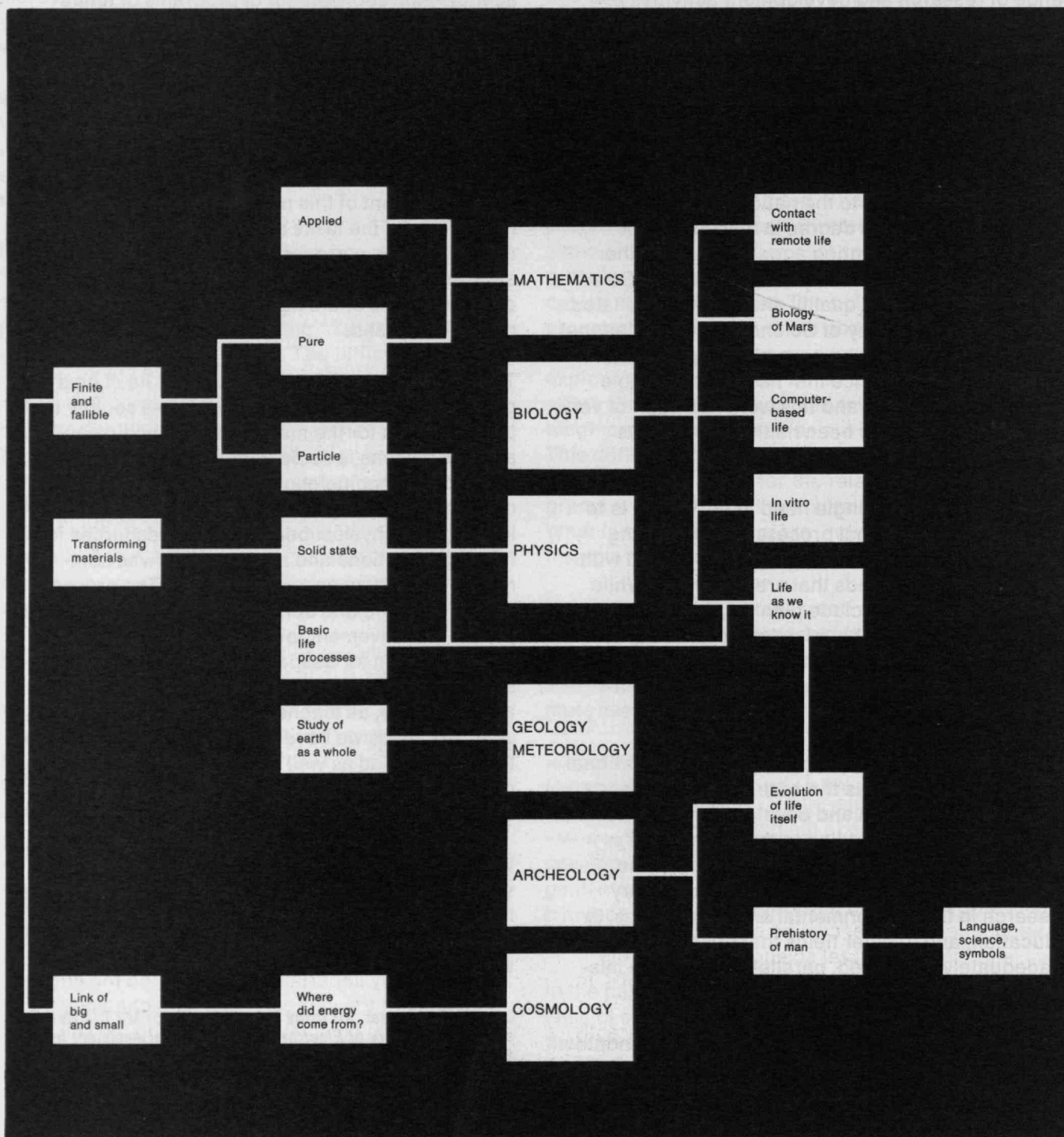
The four responsibilities that I propose for the new agency—the sponsorship of programs of fundamental and applied science, the sharing with other governmental agencies of support for exploratory research related to the numerous governmental missions, the forecasting and resource allocation planning efforts, and the support of the nation's universities—are closely related. They would all profit from inclusion within a single entity. Only by an arrangement of this nature which constantly reminds us of the tasks ahead will we succeed in re-establishing a proper national priority for science and thus insure that the scientific and technical capabilities of the nation are adequate and properly focused.

The United States long ago launched itself on a course of creating a decent society—a society that provided both for the material and psychic needs of all of its citizens, a society that provided a rewarding and challenging opportunity for all of its members, a society that was committed to preserving its great physical beauty and its resources for future generations and a society that was committed to freedom and justice for all. The present turmoil at home and abroad should be regarded as part of the movement towards those goals rather than as reason for despair. Our national resolve should be to strive hard for them. As engineers and scientists, as teachers and entrepreneurs in scientific fields we have a key role to play in moving the world ahead as well as providing for our security. It is this fact which is inadequately appreciated.

We need a recommitment to an aggressive, vital scientific program, a rededication motivated by the true need of our society, the need to be continuously inventing our future, if we are to remain a vital nation.

Jerome B. Wiesner, for many years Director of M.I.T.'s Research Laboratory of Electronics, was Special Assistant for Science and Technology to Presidents John F. Kennedy and Lyndon B. Johnson before returning in 1964 to become Dean of the School of Science and later Provost of the Institute. This essay is adapted from the address delivered by Dr. Wiesner at the dedication of the Celanese Research Company's Technical Information Center in Summit, N.J., this fall.

"Scale, then, is the dominant change. Scale change in terms of the number of people involved, number of problems on which we work, number of levels in time and in space at which we look. . . ."



While man progresses in all knowledge of himself and his world, the ecumenical spirit of true science will be the yardstick of his achievement

Philip Morrison
Professor of Physics, M.I.T.

Intellectual Prospects for the Year 2000: The Natural Sciences

Any effort to foresee intellectual progress in the next 30 years—before the year 2000—is doomed to profound uncertainty. Indeed, the task itself of making the prediction is its most valuable part. The sort of predictions which I propose—of growth in the pith and scope of our knowledge, of continued progress in mathematics and physics, of new disciplines in biology, and of a splendid enlargement of geology, cosmology, and archaeology will not make a complete or even a nearly true picture of the world in the year 2000. But such predictions can tell us a great deal about the world here and now, and therein lies the virtue of the exercise.

How does one operate a crystal ball? Mine operates primarily by those ancient principles known to poets and physicists alike, i.e., by continuity and by analogy. This means, of course, that I must omit the discontinuities, the revolutions, and the politics—by far the most interesting part of my subject matter. And, if I venture a guess or two on prophetic principles, let it be said that something much more surprising than what I propose will in fact occur! The imagination is, in general, remarkably inadequate to the consequences of reality; truth, indeed, has become far stranger, and far more interesting, than fiction.

Turing, Yukawa, and the Proliferation of Knowledge

Let me begin my projections for the bimillennial with a simple calculation. Today the entire world community of scientists—that is, the people trying to advance knowledge in the natural sciences to some degree—amounts to approximately three-fourths of a million persons. Added to these are others who by training and vocation are involved in applications of science, like engineering, medicine, and the agricultural sciences; together the total may amount to some three million persons. If I project this forward, I estimate that the bimillennial will see some three million persons directly engaged in scientific research and some 20 million engaged in its applications, serving a population which will total—and we are already committed to this—some six billion persons. These

numbers are surprisingly small, considering that a single U.S. television program now reaches 10 times as many people as the present total number of scientists in the world.

I have another statistic I like very much. A group at Brown University has published a random sample of the English language in America as it was in the year 1961: they stored one great random “mega-word.” And in the process they have discovered that a mere 1/1,000 of the English language printed in the U.S.A. in the year 1961 was mathematical formulae. It is not very difficult to extrapolate, on the basis of recent relative increases in the number of mathematicians and of scholars in the humanities and the social sciences, that 1/200 of all printed matter will be mathematical formulae in the year 2000. That statistic gives some idea, I think, of the quantity, the Gross Scientific Product, of the year 2000. Of course, what will be the quality and for what purposes this scientific product is used are questions which will require special analysis.

Continuity demands that we look back at the past in the same range of 30 to 35 years over which we propose to look into the future. Two great papers appeared in two different branches of science about 30 years ago whose seminal quality and symbolic significance for the future were far greater than anything I know of published last year. One of these was the prescient paper of Alan Mathison Turing, in which he showed that all the operations of mathematics could, broadly speaking, be translated into the operations of a machine. Turing showed that given a simple, if imaginary, machine, and a long piece of tape to run through it, he could produce nearly all of mathematics. This was an extraordinarily important claim. Though the entire philosophy of the computer and its technology by no means stem completely from Turing, he still remains a very great force for opening up the entire domain.

The second paper was much more modest and

“Science must be restored to its ancient rightful owners, all mankind, those reasoners and experimenters who gave us the truly fundamental inventions like fire, grain, the zero, the clock.”

restricted—an article in which Hideki Yukawa proposed the existence of an unstable fundamental particle, not at all visible in ordinary matter, whose transfer between the nucleons held the nucleus together. Allowing for considerable technical change, and for the enormous proliferation of complexity, it is fair to say that the particle physicists are still marching under the same intellectual banners as those which Yukawa flew in 1936. I think the enterprise will not change much with respect to this argument in the next 35 years.

Mathematics and Physics: Progress without Perfection

By the year 2000 mathematics and its applications will have an enormous impact on the means and methods of the university. Mathematics is already gaining tremendous interest among many people who see it in the repository of the behavioral sciences, and I think mathematics is likely to become a most important tool of those sciences. I also expect that we will be able to store knowledge on such a scale that the great libraries of the world will become much less singular and therefore less prized than they are today. Further, because of the immediacy with which we will have access to this information, I suspect pictures and other non-symbolic forms of representation will proliferate to become as universally used as is print today. Similarly, the lecturer will go out of date; a speech made by one man to several hundred others (with or without the aid of a microphone) will not remain, in the coming generation, the central method for the public transfer of thought.

The mathematical work of the early thirties centered around two men; Turing, with his notion of the mechanization of thought carried out in a logical way, and Gödel, who demonstrated that in a certain sense mathematics must fall short of perfectibility. This demonstration was a self-defeating victory for mathematics in our century; it showed that mathematics, like all other activities of the mind, must remain finite and fallible. These two key guides are going perpetually to be part of mathe-

matical learning; I expect that the mathematics of the century will neither repeal them nor transcend them but consist simply in working out their consequences more and more.

In physics we are seized fully with Yukawa's problem; we have found a bewildering complexity, a molecular complexity in the sub-nuclear world, as we have already known it in the super-atomic world. Whether these chains of discoveries will lead to an infinitely regressing hierarchy or instead to a clear summed-up pattern, I do not of course know. But if the analogy of mathematics is any guide, I expect the imperfectibility of physics and its finite reach to become clearer as time goes on.

When joined with the computer and the chemical subtleties of crystal growth, physics is called solid-state physics, a very poor and partisan name for an enterprise that has developed enormously into an extraordinary science characterized by molecular and crystalline design which will one day transform all materials that men fashion. This leads directly to a new juncture where the physical chemist and the biochemist will join efforts to gain, first, a clear understanding of the mechanics of catalysis, more particularly the catalytic process of enzymes, and then to a completed molecular, structural understanding of the fundamental processes of life. This is already close at hand.

Biology: Five Stems on Which to Grow

Biology, on the contrary, will experience not only a linear growth along paths already charted by the premises and discoveries of the earlier two-thirds of our century, but a proliferation of new disciplines as well. I suggest that by the year 2000 the life sciences may well have five separate branches, five kinds of life, all to be studied by the same subtle and inspired methods which the biologist since Darwin has brought to his subject. Lacking a generalized theory he has nevertheless created an extraordinary order which ranges in understanding from the principles of nucleic acid to the world distribution of the major organisms.

The first kind of life is of course that which we know today, the biology of the two or three million species of life, of which we are one. Second, will be an *in vitro* life, that is, organisms or sub-organisms made in the test tube, on the models of the organic molecules familiar in our own form of life. We are already very close to this; it is in the headlines every few months.

The third kind will deal with computer-based life, which will have such properties of self-recognition and rapid communication that all of us will be taxed to distinguish them from the thought of man. Turing had this dream, and I think we will not pass the turn of the century before we realize it in some degree. Fourth, we will have a biology of Mars; it will surely be an impoverished one but one which will at least offer a remarkable insight into the earliest growth of life as we know it on earth. And, finally, we might just have made contact with remote life near some other star! It is a matter of finite probability, I think, but to put a time limit on such an event is to speak without evidence. I merely guess that it may occur.

The great problems of biology remain ahead of us: the development of the cell into that remarkable hierarchy which we call an organism. This problem will be in the active stage of solution in 2000, just as the genetic problem is in the active stage of solution today. On the other hand, the operations of that still more subtle complex, the brain itself, will not have achieved that substantial a level of understanding by that time.

Changes of Scale: Number, Time, and Power

I would like to speak a little more reflectively now, about a change in the scale of our thought—a change which is and will be made possible by the power of our present means and by the large number of human beings who will be trained and working at the examination of the natural world. First, clearly, where our geology was once a study of the origins of glacial lakes or the configuration of Chesapeake Bay, we now treat the earth more and

more as a whole, studying the growth and decline of continents and oceans. Already we have this well in hand, and it is certainly going to grow. Now the depths of the seas and even the core of the earth are becoming accessible to us, just as the great interior continents became accessible to mappers in the last part of the Nineteenth Century.

Today's photography of the earth as a whole enables us for the first time to view weather systems from above on a scale appropriate to their size. Until now, we have pictured the weather as we once pieced together a map of the world—by painstakingly collating telegrams which arrived from time to time, reports from the weather stations and occasional ships, by enormous co-ordinate human effort. I feel admiration and pride in the intellectual tradition of our natural sciences when I compare the photographs taken today from high-flying satellites with the early geographical maps, which were all made by men restricted to sighting 20 miles at a time. But because they knew how to measure, and because they knew about instruments and about patience and about calculations, they were able to find nearly every headland and every cape and set it reliably in place so that the map of 1900 looked just like the photographs look today. We no longer have to depend on that method; and, on the whole, I think we will become much more powerful in coping with the dynamic problems—the weather, ocean currents and so on—which we could never master before.

The second scale change is in time. Until now, we have been restricted to seeing early life through the fossil record alone. The museums were full of them; that was paleontology. However, we now see that there was an enormous period before the pre-Cambrian era when all the achievements of life, all life's cunning discoveries of the master tape and the enzyme machinery were made. Probably they were made in a whole succession of independent domains, which came together symbiotically in the forms of life which we now recognize—the meta-zoan life which sprang up in the Cambrian and

evolved to the present time. I feel sure that filling in the first two billion years before the Cambrian is going to be the task of a whole variety of sciences in the future—sciences based on careful electron microscopy, on powerful new geological reconnaissance methods, on laboratory simulation synthesis and analysis.

There will be increased inquiry not only into the origins of different forms of life but into man's origins as well. At the moment, we begin man's symbolic achievements with the first writing; with those tablets in clay from Sumer, which are 5,000 or 6,000 years old. But today's archaeologists and prehistorians are pressing our understanding of the growth of man's symbolic consciousness back into the very beginnings of language itself. Already we see it in the work of Willy Hartner in the prehistory of mathematics and astronomy, of Mellaart, whose recent excavations in Çatal-Hüyük, in Anatolia, suggest one unexpected intermediate step between the old hunting culture and the agricultural form of life. As we dig deeper and we see more of the early world, we will find a much richer symbolic legacy coming to us, not just from writing, but from the language, the ideas, the concepts, the myths, the ruined structure which are our common heritage.

A related area is the seminal work of Andre Leroi-Gourhan, which has some points of doubt, but which is reopening up an entire generation of inquiry. He has shown that the Magdalenian painters of the caves, whose work has been admired for a century, were not rude ape-men who were inspired to paint but men following a more or less elaborate symbolic structure. One may question this particular theory, but all the work insists that the operations of men with abstract thought are much older than the records we now have. It will be our task to test those records to the utmost, in the physical sciences as well as in the humanities, and to examine every trace of what happened in thought *before* it could be written down.

A further implication of the same change in scale is the opening up of new parts of the globe to archaeological exploration. Nowhere is the painstaking reconstruction of the past so advanced today as in Western Europe, and in Britain, particularly; it is their great triumph. The rest of the world, save only the Middle East and Greece in which the West Europeans have been chiefly active, is by comparison an archaeological blank. But as new independent countries with more independent economies come into being, the forces of nationalism and wealth will combine to make their archaeological resources more accessible. We see this in China today. What a wealth of human history will then be uncovered—expressed in all the languages

spoken by men. We shall finally begin to understand the universal history and prehistory of man.

Finally to the list of scale changes I will add a subject of my own interest which is trembling on the eve of a great campaign: the science of cosmology. This could answer the great eschatological questions: Where did matter and energy come from? What will become of it all in the end? What is the history of the earth? The evolution of the stars and of the universe? We have begun to come to grips with these issues afresh in the last few years. By the end of the century we should have some substantial scientific answers to these questions. They will not be answered in terms of ultimates but instead in terms of continuity with the conditions of our own existence. Perhaps we will even come to see a connection between the large and the small, between the fundamental particles and the early fireball of the universe, a connection which physicists have hoped for but never found during the past 50 years.

This, then, is the dominant change: scale. Scale change in terms of the number of people involved, number of problems on which we work, number of levels in time and in space at which we look. This, I think, is simply a clear-extrapolation of the present tense.

Three Changes: Food, Education and Ecumenicism

By way of conclusion, I would like to make three assertions which are not in the nature of continuity. They are simply guesses concerning the circumstances of the future. The opposite of any one of them may be substituted for each, or different forms of the same type of novelty may in fact arise. (I omit to discuss the rise of new large energy sources and the beginnings of genetic public health and medicine, two evident lines of development.)

First, the prior task which lies ahead of the next generation—when there will be five or six billion persons our planet will be committed to support—will be to find food on a gigantic scale. This could be a task involving an enormous amount of biology and meteorology as well as simple adventure; indeed, the fight against hunger may finally answer William James's famous challenge to man to find a moral equivalent to the kind of sacrifice which war has always demanded. This equivalent might come, for example, with the development of the great krill fishery in the southern oceans by 1990.

The krill is a crustacean species; broadly speaking, it might be vulgarly called a shrimp. It forms the link in the great ocean food chain. The sun causes a myriad of microscopic green cells to grow in the long, sunny summer of the Antarctic oceans.

The krill eat these plants, and the blue whales—once the second most massive species on earth after man himself—cruise through the sea, sip the water, and expel it, filtering out and swallowing krill by the ton. I propose we cut into this food chain back one more step—for we have already wantonly and wastefully hunted the blue whale—and go directly after the krill. I estimate that half the protein needed in the world could be supplied by about 400 factory ships, each with about 25 catcher boats—little artificial whales. I am satisfied that this protein, used in all sorts of ways, will be found acceptable by many populations in a protein-short world.

With such an industry must come all sorts of related developments: a meteorological service of prodigiously good quality, satellite surveys, submarine examinations, buoys everywhere signaling the presence of the krill and avoiding interference with the whales, search and rescue and medical missions for the hundreds of thousands of workmen laboring on the roaring ocean. If this sounds Utopian—indeed, it has that quality—remember that the capital involved, the investment required, is very like that which built the Strategic Air Command of the U.S. Air Force, which grew in 20 years from an embryo to an organization similar to the one just described, centered not on food but on bombs. Thus, perhaps, we can tide ourselves over to a time when population can be limited by reason and by love, and not by the traditional historical forces of pestilence, famine, and war.

Second, I anticipate changes in education to increase greatly the number of people in science and to spread an understanding of the nature of science to a far wider population than know it today. I think education must become much more apprentice-like than it is, much more based on questions. Our students learn theorems and equations pretty much as the students of Aristotle and of medieval universities learned them, without much chance to question. They're told to "verify by experiment," which, of course, is no experiment at all. There exists a model for an apprentice system already in our best graduate schools, in the kind of relationship which grows up between students and their professors. It has molded most scientists of my acquaintance into people something like the men they worked with.

I think a continuum should come into being in education—a continuum in age, in time, and in space. We must be able to tell students to think about any subject, any science, at any place in the world and at any time in his life; he can mix them up, vary them, modify them. Along with this notion, it follows that many careers might be followed by one person. Specialization will remain, but it will be

more and more the specialization of a community, not the single, unique specialization by individuals that we have now. Such a broad, flexible system could afford to re-educate, to train, to bring new people steadily into and out of a field; it would be willing to take a skilled architect or a skilled brain surgeon and allow him to spend five years as a very unskilled linguist. Such a broadening educational experience would be a remarkably valuable one for human life. It is, I think, one of the marvelous possibilities which will be increasingly open to us as the century advances to the year 2000. Specialization must be from within, and not from the demands of economic life.

Toward a Universal World Science

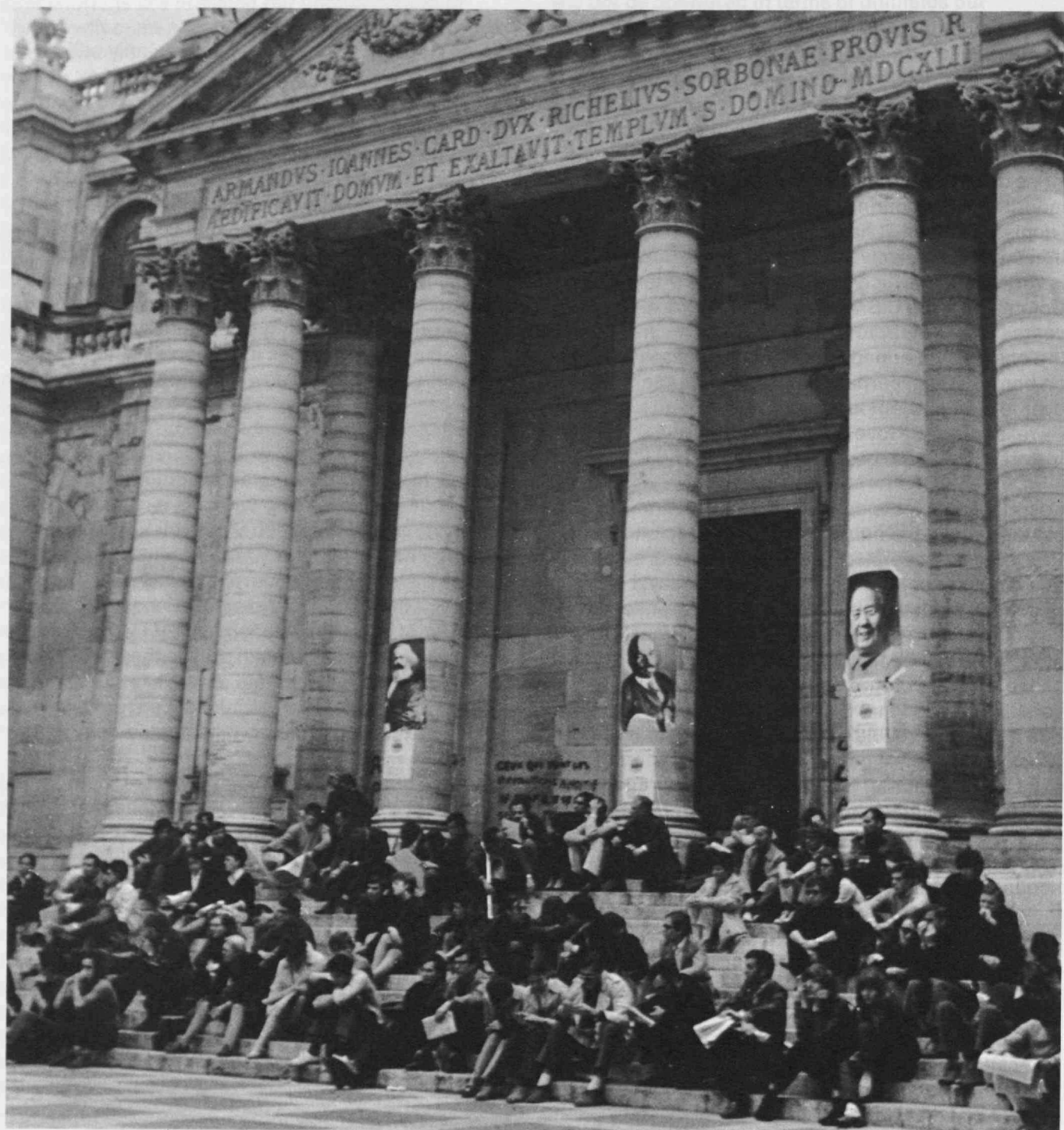
Finally, I must speak out for what I can only call ecumenicism. Our science is the science of a certain little peninsula of Asia washed mostly by the waters of the Mediterranean and the North Sea. In the last three or four years whether you regard the events as tragic or farcical, or melodramatic—the method and the technique of that science which was once Tuscan have now become worldwide. Last year in the ancient heart of Asia, near the Gobi Desert, a thermonuclear bomb was exploded; it was made, more or less independently, by Chinese; and the Chinese have, first of all men, synthesized insulin. I take these things as symbols of the fact that Galilean science is now worldwide.

It is up to us, the scientists of our time, to see to it that the new contributions from science will in fact flow to all countries, to all conditions of life, as they have in the past flowed from all lands. Most particularly, I argue that our science has been limited by its extraordinary masculinity. The human species is strangely polymorphic; yet we see in science at most a few per cent of women. The character of science has been largely stamped by that exclusion. Science cannot have the universal quality which I envisage until a way is found to bring to it those different attitudes, concerns, and, above all, questions which women could contribute.

Of course I recognize that science is no longer the property of a mere peninsula of Asia, inhabited by a curiously unpigmented group. Instead, it has to be restored to its ancient rightful owners, all mankind, those reasoners and experimenters who gave us the truly fundamental inventions like fire, grain, the zero, the clock. In the next 30 to 50 years such an ecumenical spirit must—and will—I believe inform the science of our little planet.

Philip Morrison, Professor of Physics at M.I.T., has made important contributions to theoretical physics, astrophysics, and education. This essay is based on an address to a symposium in connection with the inauguration of Robert W. Morse as President of Case Western Reserve University in April, 1968.

"To concentrate attention on the 'hippy' happenings—at Columbia University, the Sorbonne (below), or the Theatre de l'Odéon—is to lose sight of the lesson these events imply; the grave danger being faced by . . . the free university and the humanist-oriented state . . ." (Photo: Bernard T. Feld)



An M.I.T. professor describes his firsthand impressions of the role and attitudes of scientists and students in the two major European upheavals of the last year

Bernard T. Feld
Professor of Physics, M.I.T.

Scientists and Students in Europe: A Report from Prague and Paris

The following reflections were written immediately following my return from Czechoslovakia and France last May. They represent a rather impressionistic summary of my first reactions to what I experienced and saw. I have interpolated occasional comments to help the reader place these events in the context of today's situation.

Having just passed through the unique and exciting experience of observing at firsthand two European revolutions, I feel impelled to set down my impressions while they are fresh. Although I am hardly qualified as an expert from my limited experience in both countries—five days in Czechoslovakia and three in Paris, May 15-19 and 22-24, respectively—the particular times of my visit in each country happened to be simultaneous with climactic events in each revolution.

In both countries, the revolutions have ended in what appears on the surface as failure. In France, the excess of disruption led to President Charles de Gaulle's dissolution of Parliament. The new elections in June resulted in the almost complete eclipse of the "left" and a Gaullist victory. However, although this was seen as a repudiation of the revolt, the new government has conformed to De Gaulle's promise and initiated a series of far-reaching reforms to decentralize universities and laboratories, and to permit greater participation by students and research workers in the decisions made by their institutions.

In Czechoslovakia, on the other hand, the phenomenal success of the revolutionary reforms of last spring was followed by the feared reaction—Russian military intervention and the present attempt to force a reversal of the liberalizing trend. So far the Czech people have resisted passively, but the prospects for their retaining any substantial fraction of the gains of last spring seem dim.

Universality of Revolt

The revolutions had in common that they were initiated by student revolts against the academic

and social *status quo*, which has traditionally denied them a voice in molding the society for which they must eventually assume responsibility. Considering the sad state of the world that we adults are passing on to them, their revolt is perhaps not surprising. However, what is most striking is the universality of the students' revolt and of their reactions and means.

In France, the uniformity of the French university system and the universality of genuine grievances among various groups meant that probably a student-begun revolt would become widespread. In Czechoslovakia, student intransigence played a leading role too; by refusing to accept piecemeal and partial reforms, the students gave heart to Czech intellectuals and spurred them on to demand thorough changes—a goal they finally appeared to have achieved when I was there.

Role of the Elites

In both countries, the scientists and the technically trained elites were abreast of the movements of reform; but, in both cases, they found themselves relegated to secondary roles. In France, this was due to the rather dogmatic notions of youthful leadership held by student leader Daniel Coin-Bendit and others at the center of the stage; in Czechoslovakia, it was because the elites, rather than the more active student groups, had a more cautious (and, as events showed, a more accurate) notion of the realities of Eastern European politics.

In contrast to the widely disseminated impression of aimlessness and anarchy, fostered by generally sensational press reports, these revolts have also begun a thorough-going reappraisal of the ideals and aims of the contemporary educational process in France, and, in Czechoslovakia, of the political process as well. To ignore this is to miss the most important message that they carry for the future. To concentrate attention on the "hippy" happenings—at Columbia University, the Sorbonne, or the Theatre de l'Odéon—is to lose sight of the lesson these events imply: the grave danger

being faced by those institutions, the free university and the humanist-oriented state, which a thoughtful and intelligent fraction of student and intellectual revolutionaries are desperately trying to save.

Deadweight and Sparks: France

In France, the student revolt started at Nanterre, a new suburban branch of the University of Paris. Nanterre, along with a number of other new suburban centers of the University of Paris, represents an attempt to superimpose the concept of mass education onto the old French academic structure. The students found plenty of cause for protest in the sterile, dehumanized results; giant lectures with no faculty-student contacts, a completely outmoded curriculum and examination system, and absentee professors who appear from Paris to deliver their lectures and then rapidly disappear again.

The exact spark which triggered the revolt was probably a combination of spring in a dull bourgeois suburb with no outlets for high spirits, the approach of examinations, and the accumulation of years of student dissociation from a paternalistic, pompous, and conservative regime. It started with local student occupation of the University of Nanterre, but these students' grievances were soon echoed at many other Parisian universities, especially the Sorbonne. There it might have stopped, but for the authorities' commission of the usual administrative idiocy of calling in the police to dislodge the students from the Place de la Sorbonne. When the police gave vent to their long-standing class antagonism against the students by an attack, the lid was off. Within very few days all the universities in France had been taken over by the students and the black flag of anarchism and the red flag of communism flew side by side above most of them.

The occupations did not stop at the universities; practically all the lycées were likewise occupied by students. Then the student tactics were taken over by the workers; the movement spread to fac-

tories, transportation systems, department stores, business enterprises, government bureaus. Within 10 days of the onset of the revolt more than half of the French labor force was out on strike.

The result was a strange sort of paralysis, a sort of benign anarchy, in which essential facilities, such as gas and electricity, while taken over by the workers, continued to operate in the interest of avoiding too much disruption. The government-operated radio and television stations were taken over by their staffs so that they might provide news coverage that was not necessarily pro-government. Food distribution through small shops was somehow maintained. Cinemas operated in the Latin Quarter, and the queues of students lining up to see "A Day at the Races" were as long as last year at the same cinema and for the same movie. Parisians flocked to the Luxembourg Gardens with their children and dogs on the beautiful spring Assumption Day holiday. But this time they made a detour through the courtyard of the Sorbonne to observe the student circus—interminable discussions and harangues, the booths advertising Marxist, anarchist, Trotskyist, and Maoist tracts.

But the Latin Quarter, the traditional center of Parisian student life, soon dispelled any notions of business as usual. On the borders of the Luxembourg Gardens near the heavily guarded French Senate, the Odeon Theatre was occupied very early by the students to serve as the forum for the expression of their ideas. It was now run on a 24-hour-a-day basis by a group of young actors and political agitators who staged improvised and impromptu presentations with uninhibited audience participation. Between the acts there met a permanent town meeting in which the entire audience could express views on any subject.

The Older Generation

My first evening in Paris, I was invited to a party at the home of an official of the Ministry of Education. A former minister and a high government official were present, and the conversation naturally

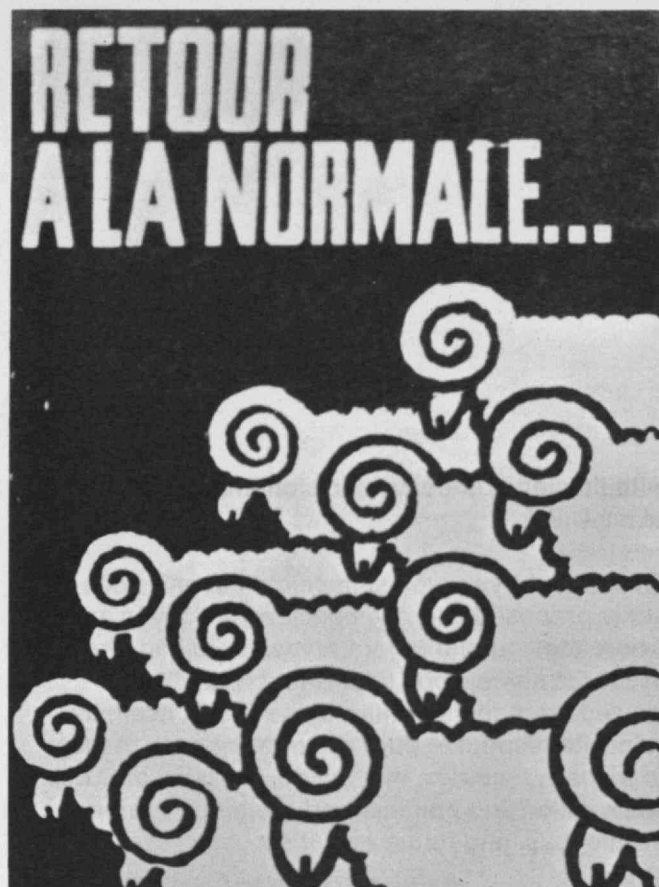
The photographs on this and the following page demonstrate the remarkable visual accompaniment to the May uprising in Paris. Their origin is described by James C. Douglass in *Print* magazine for September/October: "Students of l'Ecole des Beaux Arts and l'Ecole des Arts Decoratifs supported the movement by creating graphics of revolt . . . The work was carried out by teams of designers. . . . Each morning one or two themes would be chosen, developed in sketch form, then submitted to general criticism . . . Later (the students) manned the schools' printing studios, produced 300 to 500 posters daily . . . (to be) pasted onto walls and trees during the night . . . preferably in locations where it was prohibited by law to post bills." (Photos: Ave Pildas from *Print* magazine)

turned to the current goings-on, in that semidetached, analytical fashion that the French cultivate in approaching political events. Typically, too, the most animated arguments were aroused by General De Gaulle's use of the French tongue in response to the upsets which had forced him to curtail his Rumanian trip and to return to the country. "La reforme, oui; la chie-en-lit, non!" he had told the nation. While "chie-en-lit" means a "masquerade" or "farce," it is also a somewhat disreputable and slightly archaic slang expression for bed-wetting.

The next night, I visited some scientists from the universities and research laboratories; the atmosphere was decidedly different. While they were amazed and appalled at the government's stupidity, fearful of further bloodshed, and generally sympathetic with the students' position, the attitude of my friends was nonetheless ambivalent. Difficult as it was for them to condone the students' nihilistic approach and revolutionary tactics, it was even more difficult to accept the position of total rejection in which they found themselves. Many were old leaders in the resistance, generally of the Left, who had fought for years for university and laboratory reform. Thus they found it especially hard to swallow a disqualification from participation which was based solely on the fact that they had passed the age of 30.

The atmosphere was considerably lightened by the recital by another guest—a most distinguished Eastern European scientist of unimpeachable independence and notorious outspokenness—of his firsthand observations of a student-police confrontation in which the police with what seemed to him astounding gentleness and self-restraint withstood verbal taunting and insult followed by a barrage of bottles and stones for a full half hour before finally advancing with tear gas and clubs to disperse the students. "Why, in my country it would not have lasted five minutes!" he concluded.

Actually, this scientist was in general sympathy with



the broad aims of reform of the revolts, but he thought that the demands were excessive and unrealistic and therefore doomed to failure. He was somewhat more optimistic on the prospects of the Czech revolution, provided they "did not try to go too far." Unfortunately, even he was much too optimistic about how far his government would allow the Czechs to go.

Striking for Democracy

The semiautonomous government laboratories, which stand at the interface between the French universities and industry, also were drawn into the zeal for reform. In these laboratories, as in the universities, many of the older generation, even those in authority, felt sympathetically impatient with the deadweight of the old systems. Yet here, as in the universities, those most eager for reform from below managed to take advantage of the sympathy from above to organize their revolt.

On the day of my arrival in Paris, one such laboratory, the C.E.A., or Centre d'Energie Atomique, 30 kilometers south of Paris at Saclay, decided to go on strike indefinitely. All would stay in the plant, including research assistants, technicians, and scientists. Their reasons were in part sympathy with the students and the other striking workers, partly because it was what everyone else was doing, and partly because of the dissatisfaction among younger research workers and technicians

with the very top-heavy decision-making structure of the C.E.A.

The strike force voted some eight commissions to study proposed improvements, especially in areas where the younger laboratory workers had already prepared some work. Everything was to be reviewed, from the structure of the C.E.A. itself, its role with respect to pure science and with respect to industry, salaries, military applications of C.E.A. work, union and political party relations, careers, promotions, and future activities.

When I returned to Paris to visit the Ecole Polytechnique, whose Director, Professor Louis Leprince-Ringuet, also heads the Laboratory of High-Energy Physics associated with the school, I found the revolution had developed considerably further than at Saclay. The Ecole, that bastion of the French technical elite founded by Napoleon I and imbued with a quasi-military tradition, had been among the last of the schools to succumb to the revolution, but I soon learned the extent to which it had.

The secretary of Professor Leprince-Ringuet informed me that I could find him consulting with a committee of students discussing curriculum reform. "He spends all his time with them now," she said sadly, as though she were announcing the end of a great era. "He is leaving the revision of the laboratory in the hands of his young collaborators." I found my way to the conference room, where the Laboratory Assembly was meeting. This was an *ad hoc* body which had been constituted soon after the strike, representing all levels in the laboratory, charged with determining the laboratory's future structure. It was decided to have the Assembly govern the laboratory more or less parallel with its President, who would be Professor Leprince-Ringuet. The Assembly would delegate specific problems to appropriate subcommittees: one on the research program, made up of scientists, another on salaries, made up of representatives of all categories, etc. When I remarked that the new structure did not appear to me to be significantly

different from the one which Professor Leprince-Ringuet had already been using to manage the laboratory, I was told that democracy was now being substituted for autocracy, and that younger people at all levels would take part in the decision-making process.

Having reached an agreement on a slate of candidates for a permanent Assembly to be legitimized by a laboratory-wide plebiscite the following week, the meeting broke up into small groups and passed on to other topics. (Today, the Assembly remains, and will undoubtedly become a permanent laboratory institution, although I suspect its decisions will be more consultative than decision-making.)

It seemed clear at that time, when I left Paris in May to drive south, that the De Gaulle government was making a determined effort to separate the students' revolt from that of the workers'. By settling with the workers, even to the extent of giving in to some of the more extravagant economic demands, the hope of the government seemed to be that, given time and the approaching vacation period, the student uprisings would slowly wither away.

In favor of the government's plan was the deep antagonism and distrust felt by the student leaders towards the leadership of the large unions, especially the largest, The Confédération Générale de Travail, or C.G.T. In addition, most of the students violently opposed the Communist party, which they regarded as a corrupt and conservative arm of the *status quo*. On the other hand, working against the success of the government's effort was the fact that union leadership was following its rank and file. In fact, it was running desperately to catch up, to avoid being further discredited in the workers' eyes.

As it turned out, the skeptics were right. The government, with astounding ineptness, bungled the negotiations with the C.G.T.; by acquiescing to the workers' economic demands, the government

The graphics of revolt (see the note in connection with the preceding photograph) . . .

. . . shoes found after a street fight near the Sorbonne are set out for their owners to reclaim. (Photo: Bernard T. Feld)

. . . "The struggle continues."

. . . "Vote freely."

. . . "Be young and shut up." (Poster photos by Ave Pildas from Print magazine)



strengthened the resolve of the rank and file to achieve their original political demands, including the retirement of De Gaulle. Thereupon the leaders of the C.G.T. executed a complete about-face, repudiated the "settlement," and tried to resume the leadership of the ranks by demanding the resignation of De Gaulle. But that stubborn man was confident of the support of a frightened majority of the people, and he responded by canceling his referendum and dissolving the National Assembly with a call to the French people to rally behind him to prevent a Communist takeover. Although as I wrote this, events appeared to be moving in favor of De Gaulle, a peaceful and democratic solution was by no means assured.

Beautiful, Free Prague

I arrived in Prague on a warm Wednesday morning and was met by representatives of the Czech Academy of Sciences, whose guest I was to be at a conference in the old Marienbad spa—now called Mariánské Lázně.

Although beautifully baroque as ever, Prague was much cleaner and more cheerful looking than when I had last been there, and one could sense the excitement in the bright countenances of the people on the streets. Our tour took us to the old town square where we stopped to admire the facades of the old buildings and the town hall with its medieval clock, whose figures of saints emerge to announce the hour. We were informed that the crowd outside the hall was awaiting the emergence of their President. Soon the crowd started to cheer, and cries of "Svoboda! Svoboda!" resounded through the square as a brass band, high up on the tower, broke into the Czech national anthem.

Svoboda, aside from being the name of the Czechs' popular new President, means "freedom" in Czechoslovakian, and the name never came up without its symbolic significance being noted. Symbolic meanings appear to be of special significance in this revolution. The presidential candidate of the students a year ago was a popular



minister, Cestmír Cisar (Caesar), and their rallying cry was "Cisar to the Castle," referring to Hradčany Castle, the seat of the government on a hill overlooking Prague from the other side of the river. But the students were prevailed upon to accept Svoboda—an old general with a heroic record in the resistance—not only because his choice would be more acceptable to their Communist neighbors but also, according to my Czech informants, because of the irresistible symbolism of his name.

Students Pushing K.A.N.

In this revolution, also, the students played a major public role. Their refusal to accept piecemeal and partial reforms gave heart to the Czech intellectuals and spurred them on to demand thorough change in the top leadership—a goal they finally achieved.

In Czechoslovakia, as in most Eastern European countries, the large majority of students regard the Communist party as the reactionary arm of the *status quo* and refuse to join it. They remain the most adamant advocates of the legalization of an opposition party—the Club of Non-Communists, or K.A.N., which continues to organize and grow. Many Czechs believe it will be mainly due to student pressure, or fear of adverse student reaction, that the K.A.N. will eventually be given the legal status which will permit it to run opposition candidates in the elections. However, the students have so far moderated their opposition tactics with canny recognition of the political realities.

My contacts in Czechoslovakia were mostly with scientists and artists, rather than with students. In Mariánské Lázně, most of my days were taken up at the conference, but evenings were spent exploring Prague with my Czech scientist friends. They were uniformly enthusiastic about the changes taking place. This was, above all, a revolution led by the nation's intellectuals.

The Fear: Economics and Schweik

Yet my scientist friends were more apprehensive about the future course of change than most other

Czechs. They explained that their apprehensions stemmed from two sources. First, they recognized the very tight economic bind in which their country found itself, with an obsolete plant geared to heavy industry and the production of heavy machinery. The role forced on them of industrial exporter to the less developed East-bloc "allies" had long been resented by the more western and technologically oriented Czechs who wanted to turn their talents to the improvement of their own country's living standard. Their main fear from Russia was economic pressure, for they did not yet feel strong and secure enough to turn to the West for capital to rebuild their industries.

The second worry of my Czech colleagues was internal. While the hoped-for thoroughgoing change in the top leadership of their country had taken place, the huge governmental bureaucracy was yet untouched. So the same bureaucrats who had slavishly followed every whim of the Stalinist leadership were then falling all over themselves to express their long-standing eternal devotion to the cause of liberalization—a sight which filled my friends with disgust and foreboding. Schweik, they feared, is so deeply rooted in the Czech character that only another revolution will root it out.

Art: Vitality versus Prosperity

If I needed to be convinced that things had changed in Czechoslovakia for the better since my last visit, my meetings with Czech artists would have sufficed. Most of the artists with whom I spoke talked of travel to the West and general contentment, almost prosperity. In 1964 when I visited Czechoslovakia, their main complaint had been their inability to exhibit. At that time, the government refused recognition and exhibit permission to any artist whose creations fell outside the confines of the official "socialist realism." Yet now, as one painter said: "We have a wonderful situation—we've achieved almost everything we were lacking when I saw you the last time. But somehow, not everything is for the better." After a long pause, when he seemed to be trying to decide whether or not to dissemble, he added; "You know, I think *that* period, 1963 to 1965, was our artistic high point. It's easier now, and we have recognition, or at least acceptance. But there was a spirit then, a vitality which, even with all the freedom and excitement, we seem to have lost. Who knows . . . ?"

That afternoon I visited the State Museum of Modern Art, a small branch of the National Museum. There I found two rooms of contemporary Czech art recently added to the permanent collection. On a whim, I made a survey of the dates of the works on exhibition. The immediate postwar period, characterized by realistic and didactic depictions of the horrors of war and its aftermath,

was well represented. The modern period contained many works which were dated from about 1960 on. Yet the years 1950-1960 might just as well have never happened. I suspect that art in Czechoslovakia, as elsewhere, an accurate mirror of a nation's intellectual life.

Walking back, I was attracted by some pictures in the window of an official gallery and wandered into the courtyard behind the facade to see what else was for sale. I stumbled onto a scene not unlike ones I had found at the Sorbonne. A large group of boys and girls had mounted an impromptu exhibition of art work and posters. A loud gramophone blaring Czech pop music competed with the animated discussions of the students. The art was bad, but the posters were excellent. One of these latter bore a short sermon, which summarized, better than I can, the message of these two revolutions:

"There are many permanent values in the life of men which cannot be expressed in terms of money: . . . love, bread, fantasy, and also, it is said, art."

Bernard T. Feld is a nuclear physicist whose work has been important to the American development of nuclear power and its control. He is President of the Council for a Livable World and a Past Vice Chairman of the Federation of American Scientists, and he has been instrumental in plans for the continuing series of international "Pugwash" conferences.

"Putting the various pieces of evidence together . . . one begins to sense an over-all, national pattern for the future of urban travel. That pattern focuses upon the automobile. By 1985, the average number of daily person automobile trips will double . . ." (Photo: Ewing Galloway)



In an era of increasing affluence, suburbia served by the automobile is the American's ideal. He will not change his choice tomorrow

Alexander Ganz
Lecturer, Department of City and Regional Planning, M.I.T.

The Car Is Here to Stay: Emerging Patterns of Urban Transport

Traffic congestion in our nation's larger central cities, which has become endemic in the postwar generation, will not mushroom along with the doubling of U.S. population in the next 20 years. Central cities, on the contrary, are expected to lose population by 1985, and traffic in them will increase only marginally.

By contrast, it is in the "bedroom community"—now considered beyond the hazards of urban life—where the expected growth of population, income, employment opportunities—and transportation expenditures—will make themselves felt in the next 20 years. Thus the automobile, that symbol of the present-day commuter's freeway life, will more than double in number on the suburban scene by 1985.

Indeed, a new era appears to be at hand, characterized by growing and changing demand according to rising incomes and an evolving structure of production. This shift will represent the culmination of a basic change which carries the center of economic activity to locations outside the central city core and which upgrades the quality and productivity of the economy through the dissemination of newer technology in manufacturing, trade, and transport and communication.

The study of which these are the principal conclusions was made for M.I.T.'s ongoing Project TRANSPORT and carried out through the Department of City and Regional Planning. It differs from others in the field mainly in the length of its projection into the future. Trends in car ownership, residence location preferences for different age and income groups, shifts in employment location and structure have been combined as factors on a national level in my projection of the probable net effects on transport patterns a generation from now.

In the light of the many papers exploring the conditions under which we will be living in the year 2000, a few words on other projections might be

appropriate. A cutoff date of 1985, for purposes of my analysis, was thought to be useful in gaining the perspective of a single generation on current problems. I am certain that the next 32 years will see innovations in transport technology and perhaps the emergence of new towns on a large scale—both of which will affect patterns of urban growth and transport. Nevertheless, something approximating our present transport technology will be with us for most of the next 20 years.

The Changing Pattern of Industrial Production

In 1985, at least half of all metropolitan-area workers will be living and working in the outside-central-city areas. This group, plus those who will commute out from the central city, will make up two-thirds of all metropolitan area workers, and the number will be four times as large as the number of workers commuting into the central city.

This trend was apparent as early as 1960 when only 16 per cent of the total national work force living in metropolitan regions was using radial journey-to-work travel patterns. In one generation, by 1985, the prevailing journey-to-work pattern is due to become circumferential, from one point to another outside a single central-city area.

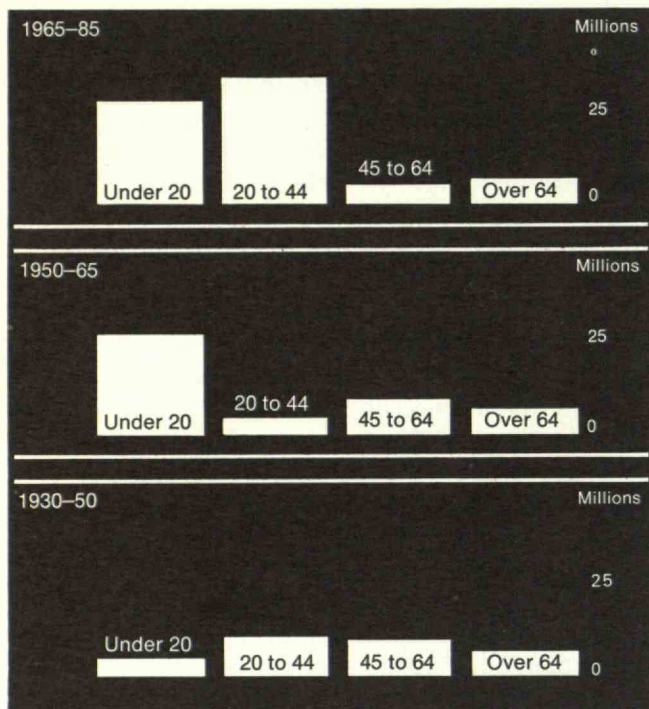
Thus the problem of peak commuter flows along a radial geographic pattern is due for dramatic change. And a new problem will be the commuting flow of central city residents outward to outside-central-city jobs. Significantly, a poorer fifth of the population, trapped in the central cities and unable to afford an auto, may have inadequate access to employment opportunities outside the central city.

A Richer, Younger Population

In one generation, 1965-1985, our nation's population will grow by one-third, a new addition of some 70 million inhabitants. The over-all rate of increase will resemble that experienced in the postwar generation. But in the coming generation, the under-45 population will grow by some 59 million, or one-third more than the increase in this same

Left—shifting patterns of age distribution between 1930 and 1985; in 16 years the greatest percentage of Americans will be in the age-20-to-44, household-owning group.

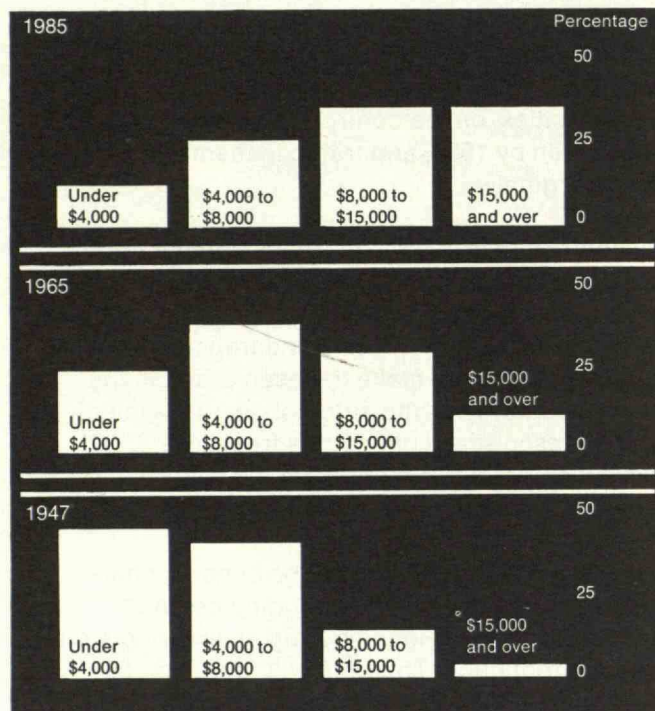
Right—shifts in income distribution between 1930 and 1985; by 1985 more American households will be richer than ever before.



age group in the entire period 1930-1965. Along with this rise will come an extraordinary increase in the age group from 20 to 44 years, a group which experienced only marginal increase in the 1930-1965 period.

The special characteristics of the under-45 age group hold great significance for population distribution and travel patterns, in terms of new households formed, residence location and type preferences, and travel mode predilections. By contrast, the age group 45 and over will experience limited growth, and with this showdown will come ceiling in the growth of the type of housing and residence locations they prefer.

Most significant of all, from the point of view of urban growth and travel patterns, is the prospective upward shift of households to higher income levels. The share of households with incomes of \$8000 and over more than doubled from 1947 to 1965 and may be expected to double again by 1985, when



more than two-thirds of all households will be receiving incomes of \$8,000 or more.

Suburban Employment

Responding to the dictates of a changing demand which will come, as it has in the past, with rising income levels and of an evolving structure of production, with related changes in manufacturing, trade, and transport technology, more than half of the increase in metropolitan-area employment in manufacturing and trade will shift to outside the central city in the course of the next generation.

At the same time, the nation's level of production is due to double by 1985. In effect, we will be adding to our factories, homes and urban facilities a quantity of new structures and installations almost equal to that which existed in 1965.

Our experience with employment locations over the last 20 years, as productivity levels steadily improved with an expanding economy, was that

Two trends already familiar to Americans in the 1960's will be accented in the next decade: our central cities will grow smaller in population while the regions around them grow larger.

virtually all growth went into the outside-central-city portion of metropolitan areas. The nation's 24 largest metropolitan areas had no rise in employment levels in the postwar period. In contrast, outside-central-city areas virtually doubled their level of employment, absorbing all the postwar increase in manufacturing and trade industries and raising their share of total metropolitan area employment from one-fourth in 1948, to two-fifths in 1963.

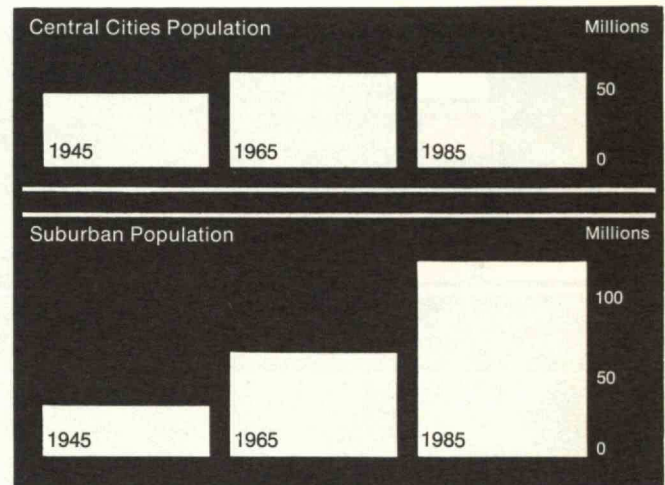
This pattern will continue. In the next 20 years, outside-central-city areas will double manufacturing and trade employment by at least a similar amount as they have gained during the postwar period. In the same 15 years, central cities will continue to lose in manufacturing and trade but will gain in service industries by a factor double that experienced in the postwar period.

A Supercongested Inner City?

Among both city planners and those laymen interested in transportation problems, there is a widely held assumption that the problem of central-city traffic congestion is practically insoluble. The logic of the assumption runs thus: since population in metropolitan areas will increase by 100,000 by 1985, it must increase by the same proportion of central city to outside-central-city residents as exists now. Thus, the present commuters' squeeze, caused by the disproportionate number of inner-city jobs, must also increase—eventually to nightmarish proportions.

My own view is more optimistic. Because of coming declines in central city population and employment, and marginal increases of daily-person trips in the next 20 years, traffic congestion in the city of the future will not be substantially greater than at present. In addition, given present efforts to improve transportation within the city, I feel that the future of downtown and commuter travel is relatively bright.

Nor do I share the neo-Malthusian predictions of

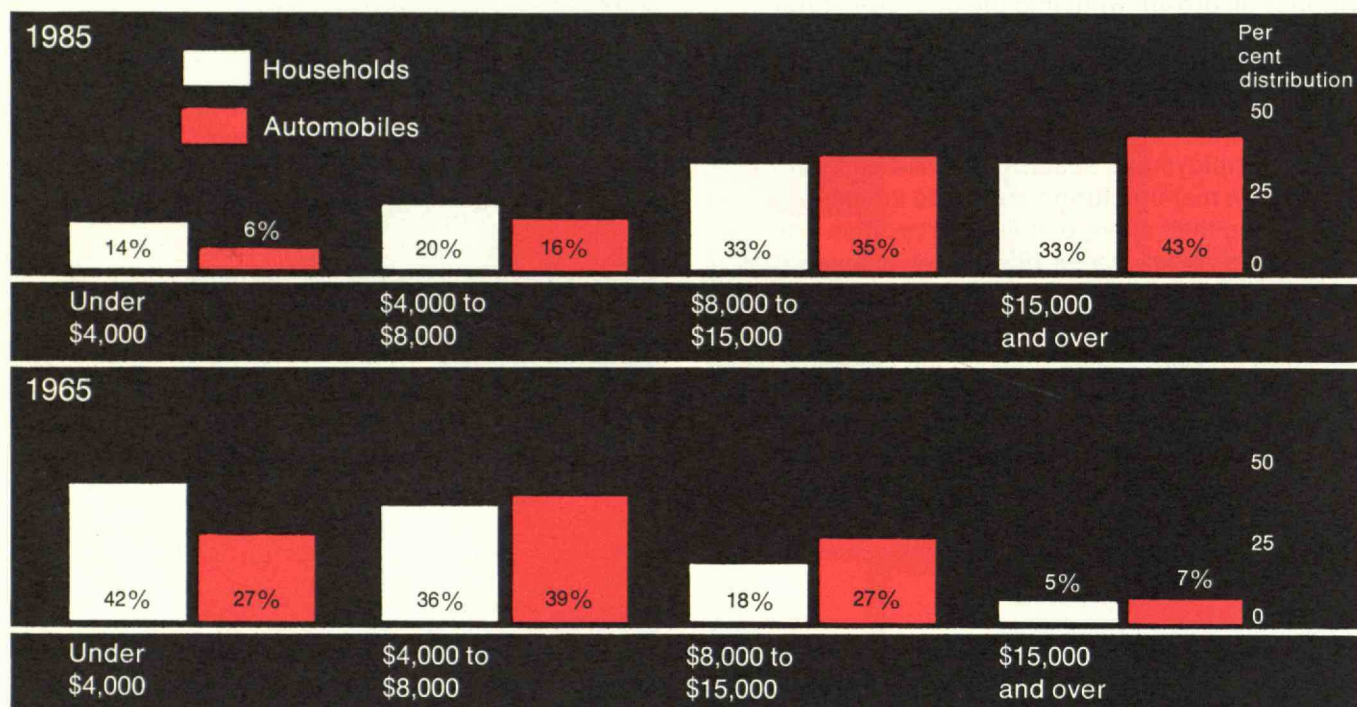


the demise of the central city. On the whole, I feel that, to persons who have lived through the Great Depression and the post-World War II housing shortage, the advantages, healthfulness, and opportunities of suburban life are not to be underrated. Given the preference of heads of households in the 20-to-44-year-old age group for single-family residences generally outside the central city areas, I am convinced that the coming generation will, on the whole, prefer suburban to urban or rural situations. Our problem is to anticipate these trends and meet the needs they imply.

From all the factors on which we can base predictions in the metropolitan economy of 1985, including factors of employment location, residence location, population composition, and travel mode preference, it is clear that many traditional views of the prospects for urban transport will have to bend. The new reality—of ever more miles of outside-central-city freeways and increased travel from one outside-central-city location to another—must force the discarding of long-cherished concepts of the growth of central-city congestion, journey-to-work patterns, and the poor prospects for the central city.

Many urban transport studies done in recent years, although made independently of one another,

As households increase their income between now and 1985, they will also increase their automobile ownership. The result will be an increasing concentration of cars in the suburban areas where the affluent households will choose to live.



reflect the impact of economic factors on travel growth and changes in travel patterns. These studies go on to translate these factors into forecasts of daily person trips and daily vehicle miles.

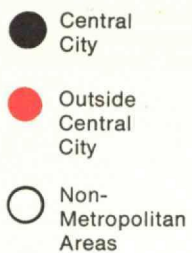
Putting the various pieces of evidence together from these individual studies—which have often been limited to a single metropolitan area, or a small time span—one begins to sense an over-all, national pattern for the future of urban travel. That pattern focuses upon the automobile. By 1985, the average number of daily person automobile trips will double as a result of a 50 per cent increase in metropolitan area population and a one-third increase in number of autos per household. Vehicle miles of urban travel will more than double, in accordance with the increased auto ownership, the increase of urbanized land and an increase of one-third in average trip length.

Yet in 1985 a substantial minority, up to one-fifth of all households earning less than \$4000 per year,

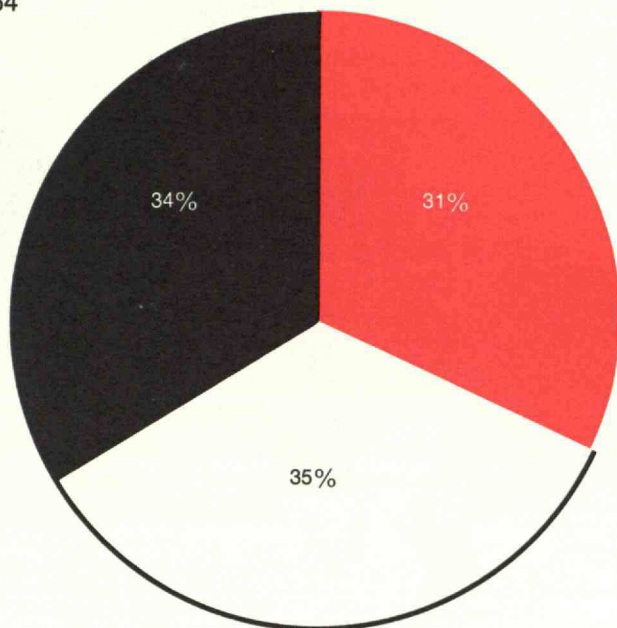
will have no chance of obtaining an automobile. For this group, depending on public transport for mobility and job access, our urban transportation may prove totally inadequate. We tend to assume that only massive public support of public transit systems can resolve the problem. But some recent studies now suggest that subsidizing the household may be a better solution than subsidizing the transport system, because public choice suggests continuing and indeed rising resistance to the use of public transportation systems.

From this trend it is easy to anticipate that the demand for urban freeway-type travel facilities will dominate the expansion of our urban transport system. Urban arterials, streets, public transit, rapid transit, and commuter railroads will continue to be important parts of the over-all urban travel picture, but the heavy pressure for new facilities will lead to doubling the urban freeway mileage, largely in routes serving two different outside central city locations. In comparison with our

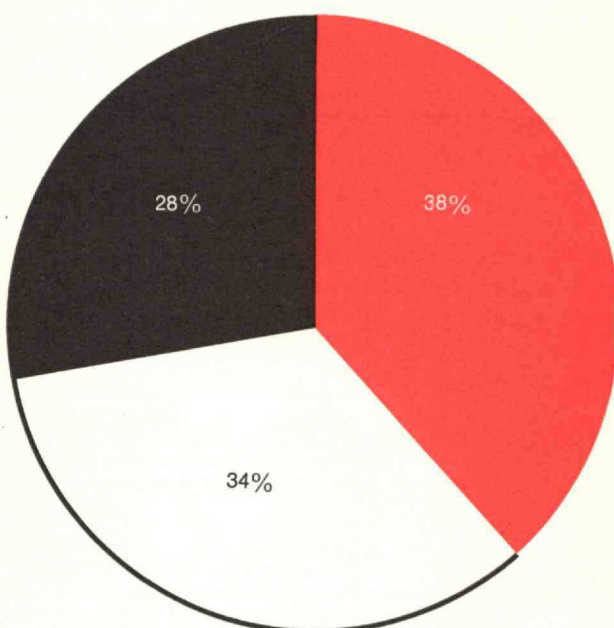
Both households and automobiles will migrate from city and country between 1964 and 1985, so that in 15 years the focus of American life will be in the suburbs.



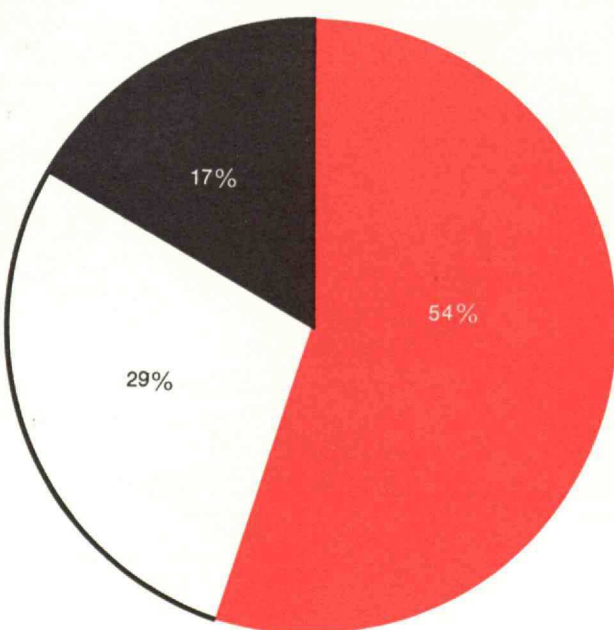
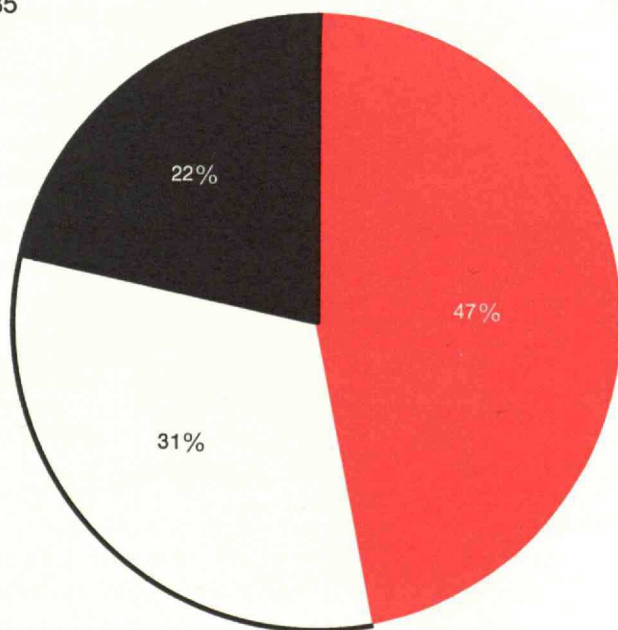
Households
1964



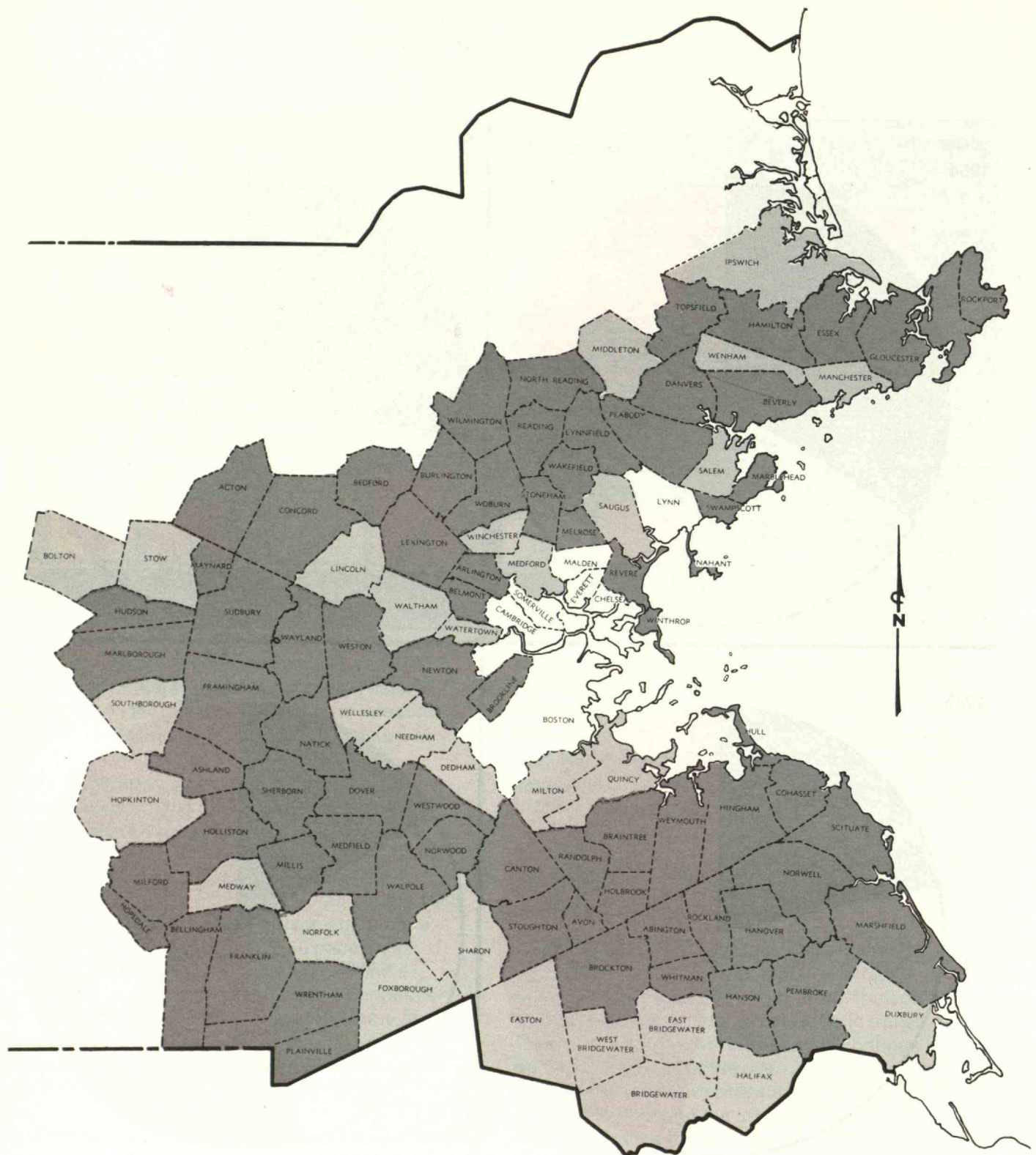
Automobiles



1985



This map reveals what these national trends hold for the Boston metropolitan area between 1965 and 1990, how the balance of power and wealth will change. The central city, already losing population, will be further depleted—and, in fact, surrounded by a ring of increasingly dense, busy communities. On the map below, locations where population density will decrease by 1990 are shown in white; where population density will increase by over 500 persons per square mile, in dark grey; where population density will increase by less than 500 persons per square mile, in light grey.



present estimated 12,000 miles of urban freeway routes, the requirement in 1985 may be 27,000 miles.

A Case in Point: Boston

Since the end of World War II, the Boston regional area, made up of some 150 cities and towns in a 30-mile radius from downtown Boston, has been experiencing the best of both worlds. It has had a relative decline in its share of such lower-wage, lower-productivity industries as textiles and leather and a significant growth in such dynamic activities as instruments and electronics, machinery and transportation, higher education, medical service, finance, recreation, and tourism. As a consequence, the area's lesser growth in population has been accompanied by one of the highest rates of growth in per capita income in the nation, reflecting the upgrading of jobs, labor force, productivity and manpower capabilities.

Within this picture, however, the central city has experienced a distinct loss of population and employment since 1950. The city itself has been left with the bulk of the poor, the larger part of the area's substandard housing, and a disproportionate share of the region's elderly.

Looking ahead to 1975 and 1990, it is safe to predict that the Boston area will be one-third more populous and twice as rich, in terms of per capita income. The growth industries of the past decade in manufactures and services will become even more dominant, and they are expected to maintain the New England area's lead in per capita income and productivity levels.

Yet with this extraordinary growth, all of Boston's net increase in population and employment will go to the suburban ring outside of the central city. The core area, including the cities of Boston, Brookline, Cambridge, Somerville, and Chelsea, will continue to lose both population and employment as it has in the past. However, the revitalization of the core area, which began with the ambitious renewal program and the expansion of government, business

and personal services, is expected to continue. In 1963, the core cities totaled 29 per cent of the regional area's population of 3.5 million. By 1990, when the population will have topped 4.7 million, the core city will have 15 per cent of that total. In 1963 the core held 560,000 jobs, or 43 per cent of the area's total. In 1990 the inner cities will offer the same number of jobs, but their share of Greater Boston's 1.8 million jobs will be far smaller.

Consequently, travel demand is expected to more than double by 1990, while vehicle miles of freeway traveled is expected to triple. Yet, the number of rapid transit trips is expected to increase by only 15 per cent.

The greatest emphasis in Boston's transportation planning should therefore be on developing additional urban freeway-type circumferentials and some radials. While travel in the ring immediately outside of the city limits along Route 128 has long been conventional in the area, by 1990 most of the projected vehicle miles of travel will occur outside of Route 128. Trips to and from the city of Boston will amount to only 9 per cent of the total mileage.

These perspectives suggest a need for substantial extension of Boston's freeways, including circumferentials and radials, and complementary improvement of arterials. These roads will meet future needs of suburban residents and industries while at the same time maintaining the viability of the central city by enhancing its accessibility and improving its links to its surrounding regional area.

Alexander Ganz is a Lecturer in the M.I.T. Department of City and Regional Planning; this article is based on a study completed during 1968 for M.I.T.'s Project TRANSPORT, with financial support under a General Motors Corporation grant for highway transportation research.

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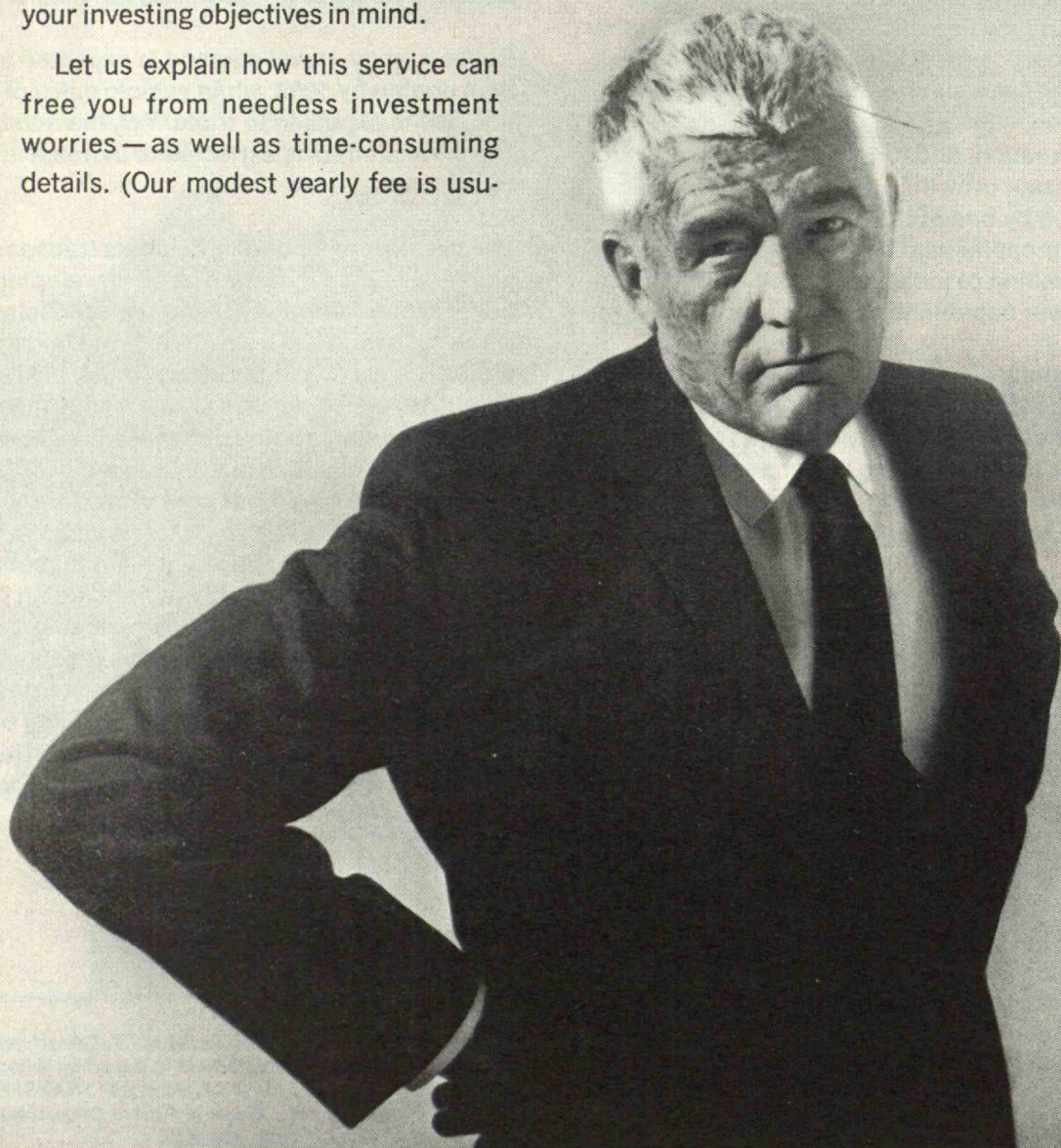
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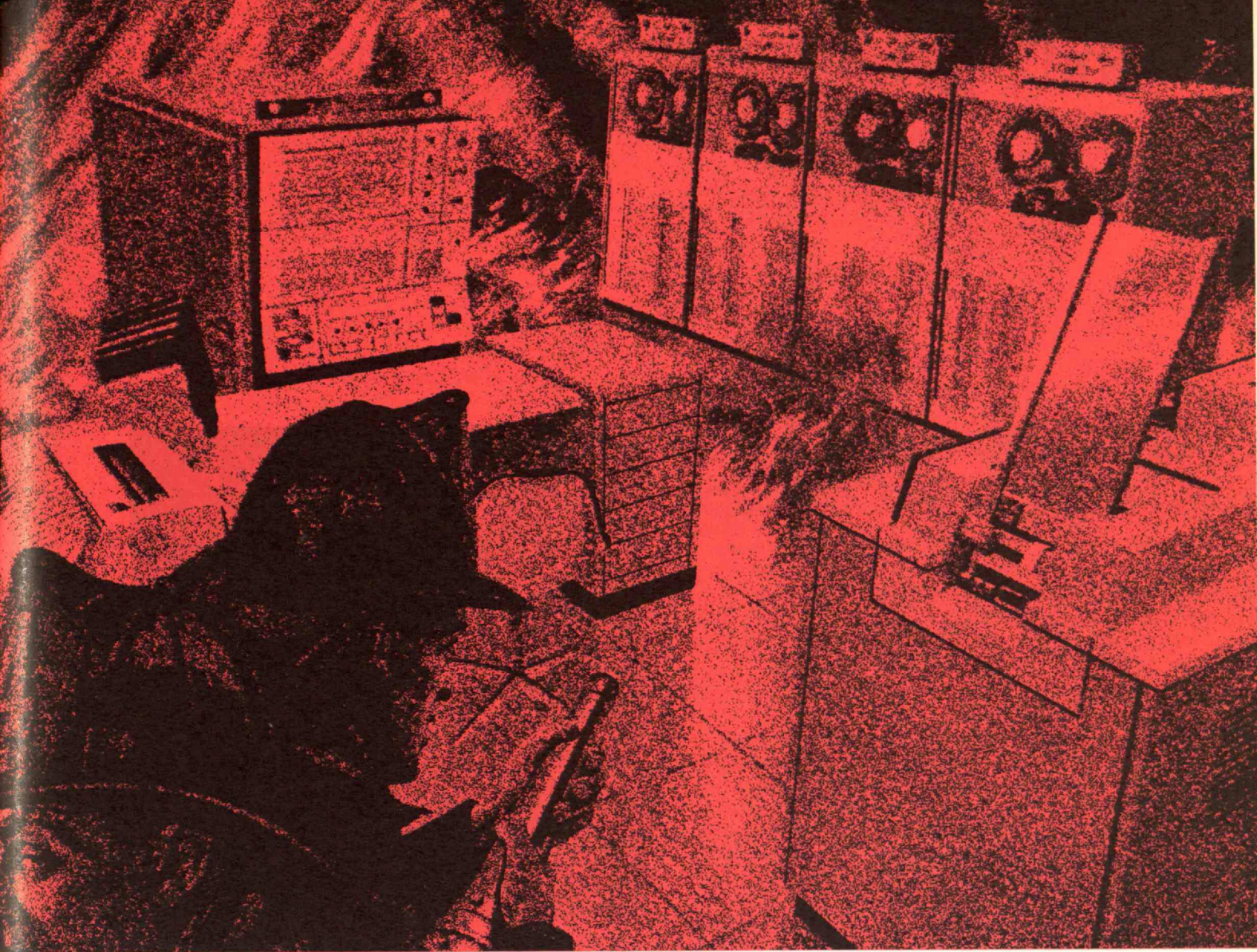
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Trend of Affairs

Air Traffic Control: A Major New Concept

A bold plan under which aircraft would use airborne digital computers and a network of digitally coded ground beacons to guide themselves through their assigned 500-foot-diameter "tubes" of airspace extending from point of takeoff to point of landing has been proposed by Herbert G. Weiss, Head of the Radar Division at M.I.T.'s Lincoln Laboratory.

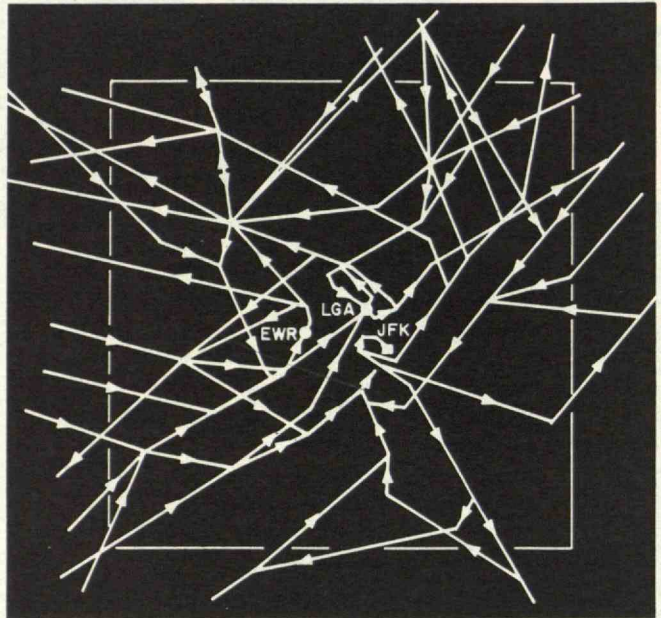
This concept would provide such accurate control of aircraft as to substantially increase the effective size of the U.S. air space, and subsequently the capacity of the U.S. airports, by permitting runway separations to be reduced from 5,000 to 1,000 feet and by the efficient use of all the available runways by continuous forecasting and flow control. "It is capable of fully meeting air navigation and air traffic control requirements for many years into the future," Mr. Weiss reported this month in a Lincoln Laboratory technical note.

All the electronics required are "within the current state of the art," Mr. Weiss reports; the system incorporates "high redundancy" on the ground and a backup emergency mode in all aircraft; and its cost appears modest in terms of the benefits of saving new airport construction and achieving higher aircraft utilization.

The new system proposed by Mr. Weiss depends upon two basic ideas:

1. Each aircraft would be assigned before takeoff to a discrete preprogrammed "tube" of airspace, and its progress down that "tube" would be scheduled in advance to assure that a runway and even a parking apron would be ready when the aircraft arrives at its destination. There would be no "stacking" in the vicinity of any terminal. "Tube" assignment would depend on the specific flight characteristics of the aircraft, weather conditions, and other factors.

2. Each airplane's own digital computer would monitor its progress along the assigned "tube" and schedule, giving instructions to the pilot to fly right or left, up or down, or to fly faster or slower.



Under routine conditions, says Mr. Weiss, there might be no voice communication at all between ground controllers and pilot during an entire flight. The whole job would be done by electronically generated data presented constantly to the pilot and monitored by ground controllers.

The thousands of "tubes" extending from city to city throughout the U.S. would be "analogous to the strands in a bowl of spaghetti," says Mr. Weiss, and their axes could be defined "with an uncertainty small compared with the size of an aircraft." As planes proceed along their assigned routes, the on-board computers would process signals from a network of digitally coded ground stations to continuously determine location and would at the same time relay to traffic controllers each plane's position and any deviations from its flight plan. The system would also be used for approach control, landing and taxiing, as it would determine aircraft positions to 100 feet within 10 miles of an airport and to within 20 feet within two miles of the runway and about 10 feet when on the ground.

Private aircraft would use the proposed system in a slightly different way, by themselves broadcasting a coded identification signal, which when received at several different surface stations, would enable

A new concept advanced by Herbert G. Weiss of M.I.T. Lincoln Laboratory would substitute computer-defined "tubes" between airports for the corridors over fixed landmarks (left, the New York City approach patterns) which now characterize air traffic control.

a computer to determine for air-traffic controllers the position and speed of each private aircraft, and the controllers would be left free to monitor these presentations for potential trouble spots. Similar airborne "beacon" transmitters on commercial craft would provide backup if their more sophisticated systems should fail.

Mr. Weiss points out that his proposed system, which exploits recent advances in digital computers, precision timing and experimental radar systems, assigns only a single aircraft to a "tube," in contrast to the many aircraft now assigned to "corridors" over ground navigation aids. As many as 10,000 such "tubes" might terminate near a large airport, so "a very large number of aircraft can progress safely through three-dimensional space." Only when they are within 15 miles of airports do these "tubes" overlap, and here automatic time-sequence programming would control the traffic flow and provide the real payoff for the integrated automatic system.

Urban Imperatives

These are the five imperatives for solving America's urban problems. John F. Collins, former Mayor of Boston who is now Visiting Professor of Urban Affairs, told an M.I.T. seminar this fall:

1. Continue today's aggressive attack on the problems of the central city, and provide increasingly adequate funding to support it.
2. Find some means for declaring restrictive suburban zoning unconstitutional. Residential zoning which prohibits industry and one- and two-acre lot requirements are as discriminatory as any more literal covenants, he said.
3. Develop many small communities into self-contained units, so that job opportunities will exist there for residents who do not have the resources for transportation.
4. Build entirely new cities to provide at once new housing and new economic opportunity, such as is proposed for the islands of Boston Harbor (see *Technology Review*, Oct./Nov., 1968, p. 80).
5. Decide that the U.S. "can no longer be the only industrial nation without some form of income maintenance."

There is today "no meaningful national debate" on these major issues, said Professor Collins. Because our cities are superficially quiet, because riots and burning may seem to be things of the past, he said, "there is no reason to think our urban crisis is behind us."

Fusion Optimism

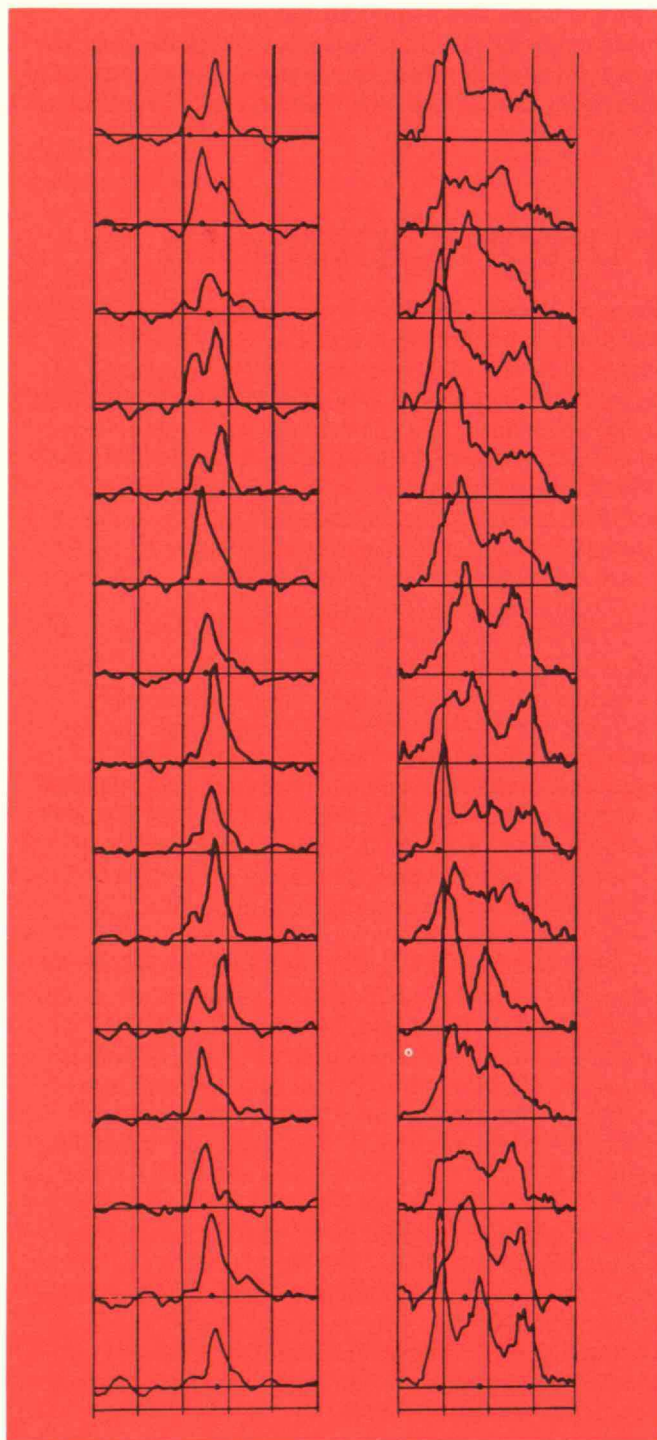
From a position of relative pessimism about the feasibility of controlling fusion, David J. Rose, Professor of Nuclear Engineering at M.I.T., has moved to a "modestly optimistic" view, he told an M.I.T. plasma dynamics seminar this fall. "We still have vast problems of physics—plasma confinement, principally—and then of materials compatibility in the environment of a continuous nuclear fusion reaction." But now there seems to Professor Rose enough promise to justify "persuading some of you young men to go to work on Ph.D.'s in these problem areas.

"The time that the reacting fusion plasma can be confined in any of the small experimental devices right now is too short—say 20 or 30 microseconds. But the same physics that gives this short time for small experiments predicts a time almost sufficiently long on a large power-producing prototype. Thus, some intermediate scale experiments would have to be built to see if the physical principles scale properly with size. It will be very expensive, but worth while.

"Even if we solved the confinement problem, we would encounter difficulty injecting fresh fuel into the heart of the reactor," Dr. Rose said. "The trouble is that it becomes ionized and trapped at the edges. Solutions appear to exist for this and other even more bizarre problems—for example, how do you start such a device?—but we really have not worked out these things in detail."

At another point, he noted that "the real crunch on fusion may be economic—lifetime of the structure facing the plasma, in view of extreme radiation damage by 14 million electron volt neutrons." Nevertheless, Dr. Rose expressed himself as "looking forward to tackling these problems," and with cautious optimism about the eventual outcome.

This chart contains the evidence to suggest that pulsars are the theoretically postulated neutron stars. It shows two series of pulses received from pulsar radio sources AP2015 + 28 and CP1919 with time advancing upward. The primary pulses show a complicated double-peak profile, upon which are superimposed the unsynchronized higher-frequency secondary pulses.



Pulsars: 10^{12} Watts From a 10-Mile Ball

As this is written, 14 pulsars—remarkable sources of periodic, immensely intense radio emissions—have been identified by British and U.S. astronomers since February, 1968. By the time this is published, the count will almost surely have gone up. For these uniquely interesting radio sources are the “scientific bombshell of 1968,” and they have turned this branch of astronomy into a “totally new game,” says Frank D. Drake, Professor of Astronomy at Cornell University, who directed Cornell’s Arecibo Radio Observatory in Puerto Rico during most of the year.

Three pulsars were added to the census during the two weeks before Dr. Drake spoke at the Northeast Electronics Research and Engineering Meeting in Boston this fall. The fourth, confirmed during the following week by three scientists at Arecibo, was “an extremely significant” observation, according to Dr. Drake, because this new radio source seems to be in the famous Crab Nebula.

The first pulsar was documented in February, 1968, by Cambridge University astronomers. They reported a source of extraordinary intense radio emission arriving in four millisecond pulses at periodic intervals more precisely timed than earthbound scientists can achieve except with atomic clocks. It was promptly recognized that, when “turned on,” this was the brightest radio object known to exist in the sky.

In the following months the competition to find and report pulsars grew into a worldwide “Olympic Games which separated the men from the boys” among astronomers, Dr. Drake says. As a result, it now is clear that pulsars operate at pulse rates which vary more or less inversely with pulse duration—that is, if the frequency of pulses is high, the duration is short. And detailed analyses revealed a pattern of two superimposed radiations: the primary burst of very high energy by which pulsars were first identified and an apparently independent emission of much less energy at a much higher period.

From the characteristics of this secondary emission have come a remarkable estimate for the size of the pulsar. The speed of light imposes a size limit on any body which is seen to radiate in pulses: the body cannot be larger than the distance light can travel between pulses. In the case of pulsars, the secondary period of 0.01 second requires that the energy source be no more than 20 miles in diameter—a stunningly small celestial body for man to be sighting.

Pulsar radiation reaching the earth is dimmed differentially by its passage through space, apparently by the clouds of interstellar hydrogen. It is therefore postulated that pulsars are beyond these hydrogen clouds, at least 10,000 light-years away.

These estimates of great distance and miniscule size make pulsars consistent with neutron stars—bodies as

massive as the sun but far more dense—theoretically postulated to result when stars exhaust their fuel supplies. The calculated density of pulsars—10 billion tons per cubic inch—is just that of atomic nuclei. And total pulsar radiation is consistent with this view. Given this density, a pulsar's magnetic field is 10^{10} gauss, compared with earth's one gauss.

Now the discovery of the fourteenth pulsar, reported by Dr. Drake at a science writers' seminar in Evanston, Ill., in mid-November, adds more supporting evidence and is, he said, "an extremely significant observation." For NPO532, confirmed at Aricebo after its radio signals were detected by the National Radio Astronomy Observatory in Green Bank, W.Va., lies in or near the Crab Nebula, a collection of stellar objects known to be the result of a huge stellar explosion, a supernova, in the year 1054 A.D. Theory suggests that neutron stars are likely to be formed in such explosions, and now a pulsar has in fact been found there.

Moreover, the new pulsar has a period of 0.033089 seconds, by far the shortest of any known. The duration of its primary radio pulses is only 0.0035 second, also the shortest known. These are figures which astronomers would expect from an object which is, astronomically speaking, very young, as is the Crab Nebula. If the theory is right, NPO532's period should be decreasing, and because the present observation is accurate to one part in a million, any change is likely to be observable quite soon, Dr. Drake says.

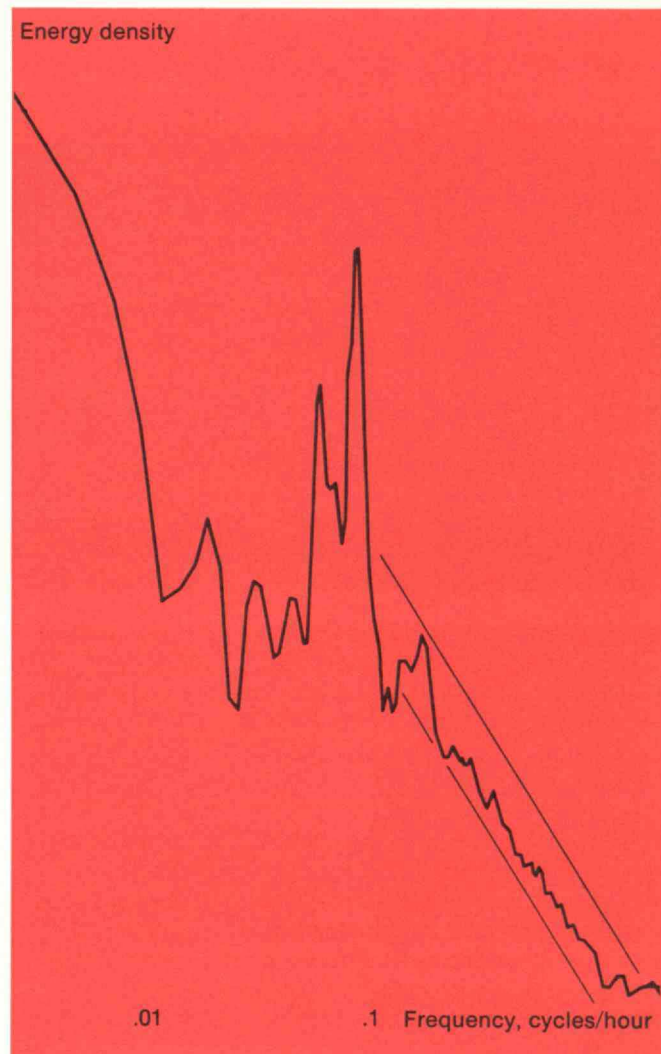
The question of how a pulsar can generate "exceedingly remarkable" quantities of radio energy is much more difficult. NPO532 shows an output during its primary flash of 10^{12} watts per square centimeter of its surface—more than man's total electrical power production on earth. The present theory, said Dr. Drake in mid-November, is that the pulsar's secondary radiation is exciting some sort of laser or maser action, producing a unidirectional beam which is the primary radiation sweeping the earth once during each pulsar rotation. Hence its precision and its dependence upon the pulsar's age. But the truly prodigious energy output cannot be explained, and Dr. Drake merely says for the present that it is "an extremely significant" observation.

Oceanic Discontinuity

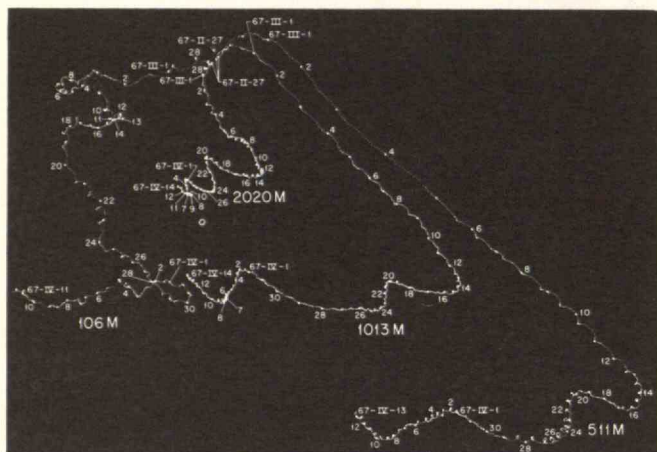
Site D is a point in the North Atlantic due south of Cape Cod and east of Delaware Bay, 50 miles beyond the edge of the continental shelf and some distance north of the meandering Gulf Stream. No landlubber would be surprised to know that ocean surface is in constant motion there, but even oceanographers have been surprised to find out what goes on beneath the surface. Continuous monitoring for nearly three years by scientists of the Woods Hole Oceanographic Institution has revealed a pattern of constant motion by the seawater at every depth under Site D.

"The apparently random pattern of motions can be analyzed to reveal a variety of physical processes,

Analysis of seawater motions at the Woods Hole Oceanographic Institution's Site D, 50 miles beyond the continental shelf off the East Coast, reveals this spectrum of horizontal kinetic energy at various frequencies. In general, for periods shorter than about eight hours, the spectrum is close to the theoretical relationship between energy and frequency (energy = frequency^{-5/3}) in homogeneous isotropic turbulence, Ferris Webster of W.H.O.I. told an M.I.T. seminar this fall. The peaks in the center of the spectrum show astronomical influences, and the large energy at low frequencies represents "appallingly large currents going in many different directions;" no one is yet even beginning to understand their dynamics.



This chart shows how particles at four different depths in the ocean would have moved over a two-week period had they been influenced by the motions observed at W.H.O.I.'s Site D. Ferris Webster of W.H.O.I., who displayed the chart at an M.I.T. seminar this fall, noted that it is the only one of many obtained at Site D which shows clear correlation of low-frequency motions at even three different depths. "If the charts were all like this," he said, "we'd expect to be able to begin to understand what is happening."



across a spectrum of periods ranging from one second to two weeks," Ferris Webster of W.H.O.I. told an M.I.T. seminar this fall. Some motions are clearly related to natural phenomena which we understand, but "a full description of their dynamics remains for the future," he said.

Clearly the movement in the middle of the spectrum—motions with periods of .05 to 0.1 cycles per hour—is related to the same astronomical events which cause the familiar tides at the ocean surface. But this tidal motion is not in phase at different depths below Site D and indeed appears to be at least "semi-independent."

"Though we recognize the problem that this finding creates," said Dr. Webster, "we haven't solved it, and no one yet understands how to explain it." There are also inertial oscillations—whirlpools related to the rotation of the earth—almost everywhere in the ocean, Dr. Webster said. Site D is no exception, and their W.H.O.I. scientists have found that these inertial motions build up and break down at random intervals of several days. While they exist, the inertial motions are circular in form, with water traveling at speeds of up to 60 centimeters per second and with periods (at Site D) of about 19 hours.

There is no apparent correlation with wind or other weather phenomena. The motion seems to be uncorrelated at various depths, and no one really understands the source of the immense amount of energy involved or why it appears and disappears. Finally, there are also very low-frequency motions at Site D—one cycle per

week or less. The long time scales of these motions make it difficult to resolve their characteristics using individual records which so far have not exceeded two months. Lots of work remains to be done both in the laboratory and at Site D before more accurate analysis is possible.

Indeed, said Dr. Webster, nearly everything that has been found by equipment at Site D thus far has raised more questions than it has answered. We are still searching for the "basic physics" of these processes, he said.

Engineering and Its Partnership with Medical Research

Though no one expects medicine and engineering to merge into a single discipline, each has more to offer the other—and the two together more to offer mankind—than either has achieved alone. After several years of watchdogging the engineering/medicine interface, the National Academy of Engineering's Committee on the Interplay of Engineering with Biology and Medicine has nothing but enthusiasm—and some cautions—for engineers and doctors who want to work together and for the universities in which most of their collaboration must continue to take place.

The Committee, which is chaired by John G. Truxal, Institute Professor at the Polytechnic Institute of Brooklyn, was the star performer at this fall's meeting of the National Academy of Engineering in Washington; Professor Truxal's exposure to the issues began as an electrical engineering student at M.I.T. in 1943.

The engineering/medicine partnership is more easily established at institutions which educate for medicine as well as for engineering. But George Bugliarello, Professor of Biotechnology and Civil Engineering at Carnegie-Mellon University (recipient of a doctorate in 1959 in civil engineering from M.I.T.), argued that all technical schools should be in the field whether or not they have medical schools. He noted particularly the excitement that awaits every engineer in the "wonderful world of heat transfer in the microvascular system."

Ernst O. Attinger, Chairman of the Division of Biomedical Engineering at the University of Virginia, spoke critically of university indifference to urgent social needs. He urged wider acceptance of university responsibility for a "total university commitment" in community service in which the needs of medicine are an integral part. "Indices of health are not only the rates of mortality and morbidity, but also the incidence of violence, alcoholism, and delinquency," Attinger stated.

Professor Attinger would undoubtedly be first to admit that not all U.S. universities are insensitive to their obligations to the community. The same message came from overseas. Robert M. Kenedi, Professor and Director of Research at the University of Strathclyde, Scotland, assured the Academy that universities in the United Kingdom are fulfilling their basic function by "including in their wardrobe in a prominent place the 'muddy boot' of development engineering and by surmounting the conventional barriers between the life and physical sciences, the medical and engineering technologies."

So persuasive has he become at the University of Washington in provoking cross-disciplinary interests in medicine and engineering that Robert F. Rushmer, Head of the Division of Bioengineering, is known around his campus as the "broker." Picking up the theme expressed by Professor Bugliarello, Dr. Rushmer underscored the stimulation awaiting engineers in working with heat-transfer and fluid-dynamics systems of the human body. "We have not begun to tap into all of the growing interest in these fields," Rushmer said.

A more militant view came from Dr. David D. Rutstein, Ridley Watts Professor of Preventive Medicine, Harvard Medical School, who strongly supported the application of modern technology through both individual research activities and a systems approach to medical practice and the engineering/medicine interfaces. For example, said Dr. Rutstein, unless doctors in research and practice capitalize upon its powers, the computer will do for them what the printing press did for the monks in the Renaissance.

"There is no system of medical care in the United States today," Dr. Rutstein declared. "Doctors are sitting around the nation in their own little medical offices practicing on the basis of their own experience when they should be part of a modern system."

And if we propose to train men for the new interface fields of medicine and engineering, said Dr. Rutstein, "we'd better begin to devise an acceptable system now." At Harvard today, he declared, the medical faculty lacks broad competence in physics, the engineering sciences, and mathematics—all essential to effective training of students for work at the engineering/medicine interface. This lack is the real reason, said Dr. Rutstein, for the joint program of teaching and research which the Harvard Medical School is now developing with M.I.T.

But don't underestimate the organizational problems, countered Herman R. Weed, Professor of Electrical Engineering at Ohio State University's Research Foun-

At the fall meeting of the National Academy of Engineering—(top) members of the panel on biomedical engineering: (seated, left to right) Ernst O. Attinger, George Bugliarello, Murray Eden, and Richard J. Johns; (standing) Lester Goodman, John G. Truxal, Edward E. David, Jr., Robert F. Rushmer, David D. Rutstein, and Herman R. Weed; (center) Professor Eden and Professor Truxal; and (below) Michael E. De Bakey of Baylor University and J. Herbert Hollomon, President of the University of Oklahoma. (Photos: Asman Photo Lab from National Academy of Engineering)



dition. "Flexibility and service must be the key objectives of any organizational structure supporting interdisciplinary research," Dr. Weed said. "The nature of biomedical engineering requires that the research programs be many and varied," and neither discipline can be the "service function of the other." The eventual result of engineering/medical collaboration should be "students working in research areas all over the campus with the opportunity to meet and work at the interface between the many disciplines. This is true biomedical engineering, both education and research."

How to Make a Union

If we need a union of engineering and medicine, how do we teach students to work at this interface?

Not through a single curriculum called biomedical engineering, Murray Eden, Professor of Electrical Engineering at M.I.T., told the National Academy of Engineering this fall (see above). "Barriers of specialization and linguistics intervene," he said, "and when such specialization is the issue, participants in the interface relationship find it difficult to communicate with each other. Although the common language is English, they seem not to be speaking it."

"Our philosophy at M.I.T.," Professor Eden said, "is to conduct a series of experiments with medical and engineering students who are smart and well motivated, putting them into course offerings in physiology, anatomy, biology and others. We have found that the medical students want to help devise the courses, and we are suggesting that they be encouraged to participate with faculty in developing these new interface relationships."

What kinds of students work well in these situations? There are two groups—one small, with depth in both engineering and medicine (but there are "few engineers who are bred-in-the-bone physiologists") and the other, a larger group, well grounded in engineering who can be given an overlay of biology and medicine—"not just taught a few casual courses, but rather given real substantive knowledge."

These courses meet the needs of two different groups of students—engineers who become interested in engineering and technology as they relate to biology and medicine as a way to put their engineering to wider use in society, and medical students who have early training in physics and mathematics and then receive a "cultural shock" upon entering medical school and finding that "their earlier training has not been relevant."

An Industry View

Industries, like universities, have trouble when they try to operate at the engineering/medicine interface. Two representatives at the fall meeting of the National Academy of Engineering, Jack Chambers, Manager of

the Biomedical Department of Stratham Instruments, Inc., and Chester Sadlow, Manager of the Biotechnology and Bioscience Department of the Westinghouse Research and Development Center, both complained that it is hard to "drag specifications" from researchers in medical schools.

Mr. Chambers described Stratham's troubles on the development of a left-ventricular bypass pump. The medical school people "came up with some 14 different models, but we had to get a decision on one for the prototype. We finally got it, but it wasn't easy. University people don't seem to recognize our need for lead time," Mr. Chambers said.

And, said Mr. Sadlow, industry faces the hard problem of finding a profitable market for such devices—"all of which must get clinical acceptance before they can be marketed. When hardware is developing so fast," he said, "it is not easy to keep abreast of it." To solve that problem, Westinghouse tries to work "right in the hospital in order to give the company the data base it requires for a total hospital operation. In this way, we seek to free the doctors from dependence on knowledge of the technology in our black box."

Mr. Chambers noted four areas in which he felt industry has special issues to raise with universities in the interface relationship between engineering and medicine:

1. Each of us needs to improve his understanding of what the other does.
2. The profit motive must continue as part of the industrial input, and industry has to keep records of costs and expenditures.
3. Industry does not mind getting instructions from physicians in medical schools but "we know our system of record-keeping is superior—so we'd rather provide that ourselves."
4. Industry knows how to advertise its wares, and this is an important part of delivering good health services.

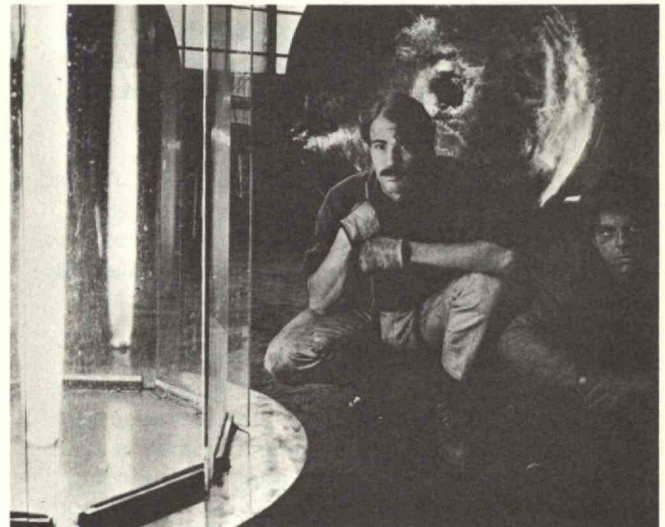
Co-worker or Helper?

When engineers and physicians work together (see above), they should for most effect do so as equal partners. But it seldom happens, said Ivan L. Bennett, Jr., Deputy Director of the Office of Science and Technology, at this fall's meeting of the National Academy of Engineering.

Because of the doctor's persistent image of medical care as the exclusive domain of the physician, said Dr. Bennett, "engineers who work with physicians are likely to have little opportunity to participate in the selection of objectives, to formulate questions, to structure or restructure problems, and to devise alternatives for their solution."

The reason? Culturally and legally, said Dr. Bennett, "authority in the medical field resides solely in the physician;" he expects to define problems, to point out

Members of Art and Technology, Inc.: (left) Alan Finneran (at the projector) and Rosamond and Harris Barron work in their studio on materials for a total theater experience which will combine sight, sound and sculpture scheduled for public presentation in January; and (right) Gary Rieverschl and Edward C. Franklin (right) are shown with a model of a flame vortex which they have titled "Franklin Stove," shown at the Brooklyn Museum this month. (Photos: Ron McNeil)



directions for solution. When engineers have joined medical teams, the physician has expected the engineers "to assist him to carry out his task as he sees it," said Dr. Bennett.

And, he said, the medical profession has a "long history of frank antagonism to patterned organization. The dual (a better word is schizophrenic) authority, administrative and professional, that still pervades the management and organization of hospitals, for example, continues to baffle industrial management consultants; it has rightly been termed 'the last refuge of the amateur,' " Dr. Bennett declared.

But the imbalance need not exist. "The strong historical precedent and the weight of tradition behind this attitude can change," Dr. Bennett told the engineers, citing examples in the Navy's underwater programs and in other federal research activities.

A.T.I. at Crossroads of Art and Technology

Art and Technology, Inc., a new organization committed to the interaction of art and technology for the total society, has emerged as an energetic, productive influence in the New England area. A working alliance of artists and technologists, A.T.I. includes in its growing membership painters, sculptors, film makers, composers, chemists, electronic engineers, metallurgists, crystallographers and computer engineers.

Similar interrelationships between art and technology are finding expression in several institution forms across the nation.

1. M.I.T.'s encouragement of the interaction of art and science was evidenced last March with inauguration of the new Center for Advanced Visual Studies. For Professor Gyorgy Kepes, Director of the Center, this is the culmination of long years of personal dedication to the interplay of art and science.
2. Experiments in Art and Technology, Inc., began in New York after the "Nine Evenings: Theatre and Engineering" two years ago and now has national and international affiliations.
3. The Los Angeles County Museum of Art recently be-

Culture Derived from Materials Science

Look at an ancient artifact as long as you want, but you won't really see it. Let the chemist, the metallurgist, the physicist analyze it, however, and values previously unsuspected come to life. This thesis was examined by Cyril Stanley Smith, M.I.T. Institute Professor, in an October lecture which opened the 1968-1969 colloquium series of the Department of Metallurgy and Materials Science.

gan a two-year special program, Art and Technology, which involves direct co-operation of California industries with artists under the aegis of the Museum.

As an active element of the general movement, Art and Technology, Inc., based in Boston, has a program attuned to the unique problems and resources of the New England region. The program includes collaboration between artists and technologists in projects demanding the highest capabilities of both disciplines; service as a forum and information center for constructive interaction between technology and the arts; communication between all of the elements of society responsible for the total environment; promotion of industrial participation in its program; and providing an atmosphere more encouraging and stimulating for the contemporary artist.

Today's technology provides an almost uncountable variety of possible tools for the contemporary artist—in electronics, from control circuitry to laser systems; in broadcast media, from new cinematographic techniques to TV and video systems; in construction materials and fabrication, from fiber optics to laminates, adhesives, and vacuum-forming processes; in computers, as design aids and as real-time elements of environmental systems—the list is endless, with each new facet of technology suggesting new means for creative expression.

Artists have always reacted to their environments; today's artists are also concerned with changing it and contributing to its structure. They are interested in bringing art to a more enlarged circle—to open the arts to the total society. The use of technology not only provides new media for the creative individual but enables him to present art to people not ordinarily reached by museum or gallery programs. A.T.I. can also, by acting as a central agency for co-operative efforts, give additional opportunities which may not be available to individual artists.

Historians have superbly analyzed the past as it is recorded in written records, and archaeologists have reconstructed much early history based upon the form of artifacts and buildings, said Professor Smith. But now, with the aid of laboratory studies, we can reveal a far more intimate picture of man's past technological activities than has yet been seen. "The internal structure of a piece of metal or ceramic can give fairly detailed information on how it was made, and to some degree it is possible to re-establish at least part of the experience of the man who made the object perhaps three or four millennia ago," Dr. Smith said.

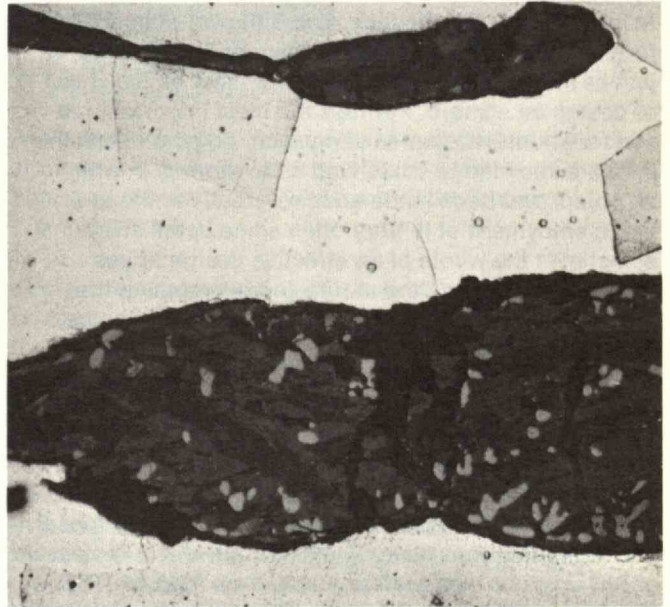
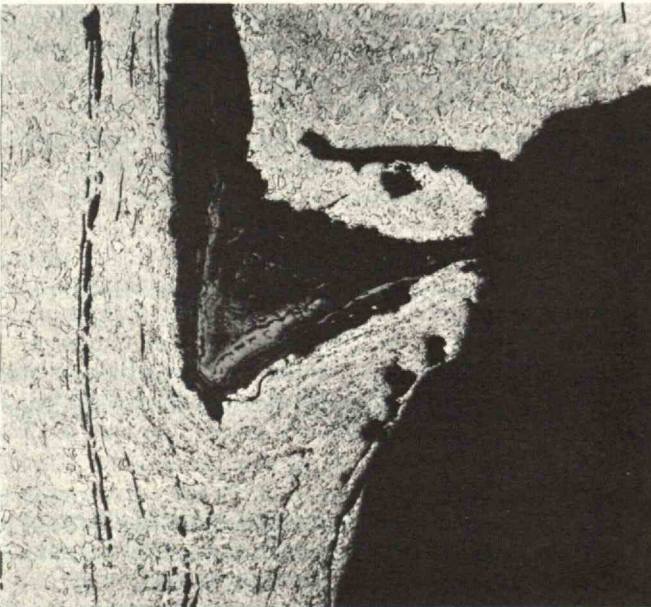
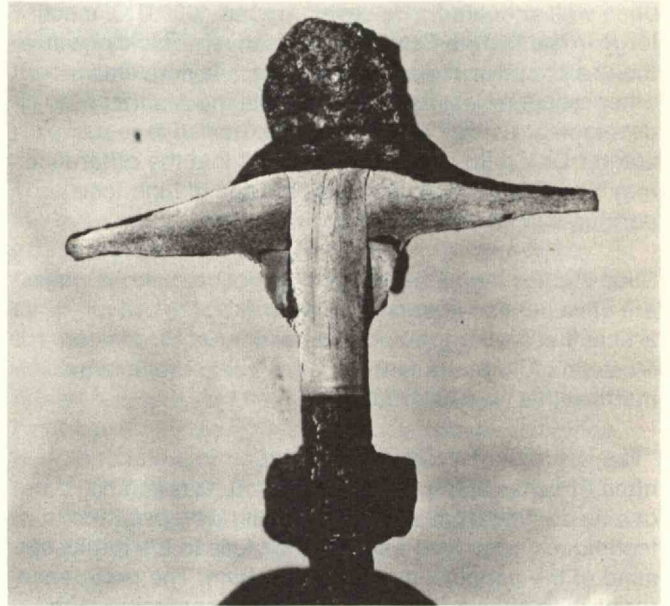
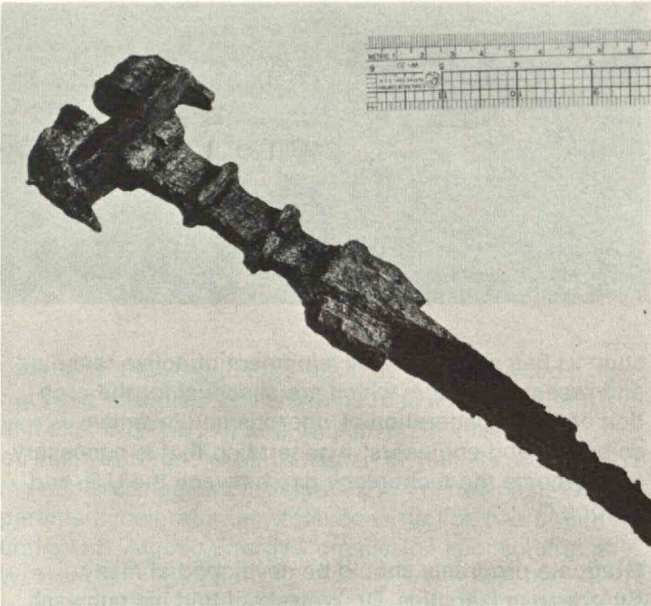
Archaeology suggests that the motivation for discovery is usually aesthetic curiosity. "The first use of almost all types of inorganic material was decorative, satisfying an aesthetic rather than a utilitarian need," explained Dr. Smith.

Studies of the distribution pattern of trace impurities in some types of objects, especially nonmetallic ones, lead to useful information on trade routes and cultural contact; impurities are sometimes uniquely related to a source. Professor Smith described recent studies at the Smithsonian Institution which have disclosed the particular village in Devonshire from which came pottery found at the first Jamestown settlement in Virginia, and studies of infrared absorption of amber done at Vassar have established beyond doubt that extensive trade existed between the Baltic and the Aegean in prehistoric times.

But science can do more than trace travel and commerce; it can also extend the range of history by giving more information on the nature of technology itself and its growth.

Using a series of slides showing the microstructure of copper alloy and steel artifacts largely from Iran, Professor Smith recited details of the history of his own profession. "Many believed that it was not possible to work native copper without annealing it. But this is not true," he said. "A sound piece of native copper can be worked extensively without cracking. Artifacts dated about 6500 to 4000 B.C. are unmistakably made of hammered copper without annealing." He made a striking comparison between the small unannealed copper decorative objects from the Middle East and the larger beautifully shaped copper spearheads made in North America between 3000 and 1000 B.C. Microstructure examination proved that the American copper had

Photomicrographs such as these of a short sword (top, left) from a Luristan grave (circa 800 B.C.) make possible reconstruction of the technique used by the Luristan smiths: at the top right, an etched section through the pommel of the sword (x 1.5); and at the lower left, a detail showing the attachment of a decorative band to the hilt of the sword (x 50). At the lower right, sample from another Iranian dagger shows crystal grains of iron surrounding an inclusion of iron silicate slag containing a second type of crystal not yet identified (x 500). The Luristan smiths made excellent use of the hammer and special swages in shaping their steel, but they did no welding, and they did not heat-treat the steel to harden it. (Photos: Cyril S. Smith)



The success of CERN "as a cooperative enterprise among men and countries of every persuasion," writes Elting E. Morison of Yale University, "is . . . a moving demonstration of the influence that science . . . can have upon the creation of enduring and rewarding intercourse among nations."

been well annealed. "However, around 4000 B.C. metallurgy in the Middle East passed relatively quickly from the use of native copper to smelting, alloying, and other metallurgical techniques, while the American development never passed beyond the native metal stage," Dr. Smith noted. He surmised that the difference may have been associated with the use of high temperatures in ceramics in the Middle East.

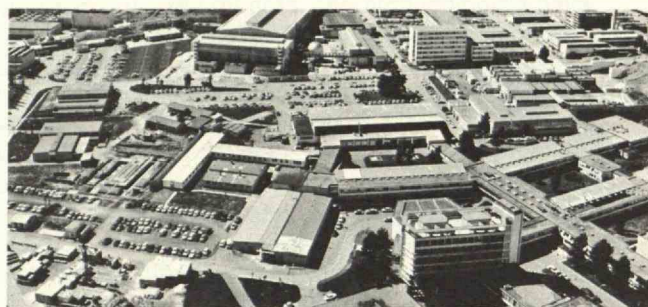
Such studies aimed at the reconstruction of techniques are of value also in appreciating works of art. In an article that he contributed to a seminar at the Boston Museum of Fine Arts last year, Professor Smith summarized this view as follows:

"The internal structure of a work of art in metal can often throw as much, or more, light on its origin as can be derived from stylistic analysis. Moreover, the techniques employed can provide clues to the habits of mind of the people who originated them. The preference for casting shown by Chinese artisans compared with the European fondness for forging must have human, or at least social, significance. The diffusion of specific forging and heat-treatment techniques can provide just as much evidence of cultural contact as the style of design on a shard. Perhaps the most important reason for structural studies of museum objects is that the intimate knowledge so derived as to the way in which an object had been made adds so greatly to the aesthetic enjoyment of it. Very often some detail and sometimes the whole of an effective design arises directly in exploiting the merits and overcoming the difficulties of a specific technique, in the reaction between the artist's fingers and his material."

Science International

Of several productive arrangements for international scientific co-operation, the most far-reaching proposal came this fall from Victor F. Weisskopf, M.I.T. Professor of Physics who was for four years, from 1961 to 1965, Director of CERN. At the international "pugwash" meetings in Nice, France, in September, Professor Weisskopf urged development of a European Institute of Science and Technology for graduate study and research.

"European university education is on a high intellectual level," he said. But "scarcity of space and financial



support has slowed the development of active teaching and research centers which are essential for the creation of a new generation of vigorous and inventive scientists and engineers, a generation that is necessary to overcome the technology gap between the U.S. and Europe."

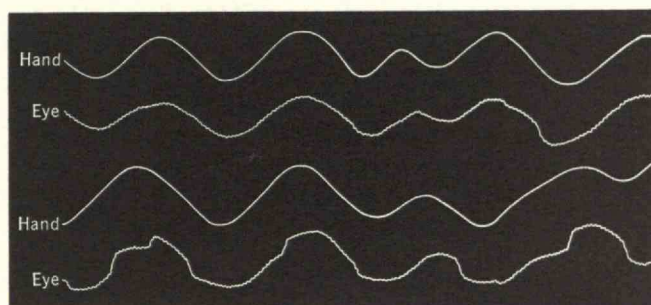
Graduate programs should be developed at many European universities, Dr. Weisskopf told his pugwash colleagues, but there are special arguments for an international institution. It would promote a "European spirit" among its students who would be "the builders of the future Europe"; it would be able better than a national university to provide high-level teaching and research; and it would provide "a center of intellectual stimulation and incentive" which would strengthen scientific and engineering work in all the participating nations.

The Weisskopf proposal heads a growing list of cooperative scientific arrangements between nations. The classic example is CERN, the European Organization for Nuclear Research, which operates a high-energy physics laboratory in Geneva, widely regarded as "one of the most important centers of modern particle physics in the world."

There may soon be others. The European Southern Sky Observatory is under construction in Chile, a new 300-GeV accelerator is under active discussion by European scientists, and the European Molecular Biology Organization hopes soon to create an international laboratory on the pattern of CERN to supplement its fellowship activities.

On a different level, the U.S. and Australia this fall concluded an agreement for international scientific co-

When the eye is instructed to follow the hand, it does so best when the hand movements are generated internally (top pair, below), not externally. M.I.T. research in which these records were generated suggests a connection between the human oculomotor and arm-control systems.



operation under which there will be joint programs between scientists of the two nations and easier entry and exit of personnel and equipment involved. And on still a different level, Canadian physicists are talking about Canadian participation in the new high-energy particle accelerator on which construction has begun under U.S. Atomic Energy Commission sponsorship at Weston, Ill.

A \$35,000 grant from the National Research Council of Canada is now being used by a committee of five Canadian physicists for feasibility studies. Bernard Margolis of McGill University, who holds an M.I.T. degree (Ph.D.) in physics and who has himself just returned from a year at CERN, says Canada might contribute Canadian-built equipment valued at up to 10 per cent of the accelerator's cost (now estimated at \$240 million). He believes this investment could readily be justified by "the development of strong experimental and theoretical physics groups" which would be catalyzed in Canada as a result.

Quicker Than Eye?

It has long been known that the human eye could track a slow-moving visual target more accurately than a fast-moving target and a periodic movement more accurately than an erratic one. Now two M.I.T. psychologists have demonstrated that erratic movements are more readily tracked when they result from the observer's own whim than when they have been generated without his participation.

Writing in *Science* magazine, Martin J. Steinbach, a graduate student, and Richard M. Held, Professor of Experimental Psychology, described experiments in

which subjects were instructed to follow with their eyes spots on their fingers when the subjects moved their own hands and when their hands were moved by an external force. Eye and target movements were recorded during both tests.

The psychologists report their surprise at finding the eye able to follow any target moving as rapidly and erratically as those chosen for this experiment; the targets moved through 20 degrees of visual angle with up to five reversals of direction per second. But, as they expected, his eye followed its target better when the target was moved by the subject than when moved by an outside influence. They conclude that "signals responsible for moving the arm also provide information about target motion that is used by the system that controls tracking movements of the eye." In other words, *your* hand may not be quicker than *your* eye—only someone else's.

Metals and Hypertension

Are trace metals now being introduced from his environment into man's system, bringing with them chronic human disease? If so, how do we rid the system of this threat?

There are no certain answers, but research now in progress at Dartmouth College, described at an M.I.T. seminar this fall by Henry Shroeder, Dartmouth Professor of Physiology, has yielded some suspicious evidence.

For example, as early as 1953 Dr. Shroeder and his associates recognized that there is "a lot of" cadmium in man's kidney and liver, presumably accumulating there as the result of food contamination by cadmium-plated containers and from small amounts of cadmium present in the atmosphere. To find out what may be its effect, they fed rats a diet essentially free of trace elements to which cadmium had been added. The result, said Dr. Shroeder, was to produce hypertension in the rats—including "changes in the kidneys comparable to the changes seen in humans with hypertension." Later, Dr. Shroeder and his co-workers found that "we

In 1967 the American Society for Engineering Education predicted that graduate engineering admissions would maintain their spectacular rise of the early 1960's, claiming an ever-increasing proportion of new engineering bachelor's graduates (dotted line). But now the Engineering Manpower Commission has reported a sharp decline in the number of new engineering graduates continuing on directly toward advanced degrees in 1968. (Chart: Engineering Manpower Commission of Engineers Joint Council)

could lower the blood pressure of the hypertensive rats when we displaced the cadmium."

The cadmium work will be given a clinical trial this winter in St. Louis, and Dr. Shroeder said he is "hopeful that the results may prove beneficial to man."

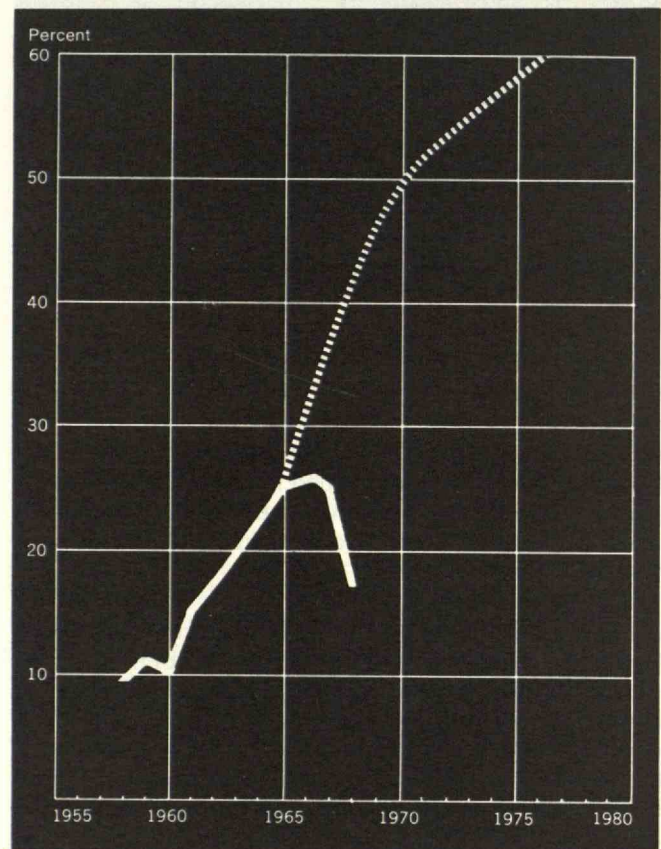
By now the Dartmouth group has tested the effects of 21 different elements on mice, and of 13 on rats. They are studying metals that are present "in quantities large enough to disturb enzyme systems, and excluding those that seem to have no adverse biological activity," he said. And he is examining the subjects for evidence of "the most common chronic diseases—atherosclerosis, hypertension, arthritis and cancer.

"We have found that an accumulation of cadmium and lead shorten the life-spans of mice and rats," Dr. Shroeder said. "In addition, a deficiency of chromium produces a change analogous to diabetes in rats. While lead is toxic to rats and mice, shortening their life-spans, it does not seem to produce a disease that is comparable to a chronic disease of man. However, there is a suggestion that chronic lead poisoning may suppress immunity."

"Sluggish Growth"

Engineering and technology graduates continue to be in brisk demand. Over 30,000 engineering degrees were given in June, 1968, and more graduates than ever before accepted employment upon graduation. Their salaries were 5 to 8 per cent higher than in 1967. Only 0.6 per cent reported that as of the date of graduation they had no job offers or plans.

But the Engineering Manpower Commission of Engineers Joint Council, which obtained and published the figures, finds grounds for pessimism. In the 12 months ending in June, 1968, says the E.M.C. report, just over 38,000 engineering bachelor's degrees were awarded in the U.S.—nearly 4,000 fewer than expected by the U.S. Office of Education. "The overall picture is one of sluggish growth," says John D. Alden, Executive Secretary of E.M.C., and engineers are becoming a smaller and smaller proportion of the nation's college graduates. The supply "may fall well short of future needs."



Of special interest and concern, says Mr. Alden, is the sharply reduced number of engineering graduates continuing into graduate schools—17.6 per cent in 1968 compared to about 25 per cent in 1966 and 1967. The reason, obviously, is the elimination of graduate student deferments by Selective Service. The result will be an abnormally low proportion of advanced degrees in the age group represented by the 1968 graduates, "and it may be years before the situation returns to normality again," according to Mr. Alden, whose own undergraduate degree was won at M.I.T. in 1949.

Self-Cleaning Fallout

Man's pollution of his world has its countereffects, for the natural environment has its own very considerable built-in mechanisms for cleansing itself. Yet this is not to say that man's abuse of the atmosphere does not in fact threaten to affect his health and welfare irreversibly.

Air purification mechanisms are subtle and apparently slow. One of the promising attempts to evaluate them was described this fall to the first Northeast Regional Meeting of the American Chemical Society by Wayne R. Matson of Abt Associates, Inc., an M.I.T. alumnus (S.B.'64, Ph.D.'68) who has for the past year participated in a University of Michigan study of the relationship between pollution abatement and water quality in southern Lake Michigan, in the "lea" of the Chicago industrial complex.

On the average, three grams of lead are liberated into the atmosphere whenever an automobile consumes one gallon of gasoline. The Lake Michigan studies, Dr. Matson told the American Chemical Society, suggested that there is "significant transport" of atmospheric lead into the water of the lake east of Chicago. "We have no idea what this does to the ecology of the lake," Dr. Matson admitted, but there seems to be no public health hazard so far concerning water used for drinking.

There is evidence that the lead does not in fact accumulate in the water—that there is biological intake of such trace materials as lead by microorganisms in the lake and that some of these materials move rather quickly from the water into the bottom sediments. By these mechanisms, said Dr. Matson, Lake Michigan really helps to renew Chicago's dirty air for "downstream" communities in Michigan, Indiana, and Ohio.

But there remains a stickier question for the future. Nuclear plants which use Lake Michigan waters for cooling will discharge into the lake trace quantities of radioactive materials. Question: Will these build up to dangerous levels in microorganisms or in bottom sediments by the mechanisms which Dr. Matson described?

It's a New Ball Game

As a society, said Robert A. Charpie, President of Bell and Howell, Inc., at an M.I.T. alumni seminar in New York this fall, we have more things on our mind than ever before. There are more "technological entrepreneurs"—inventors and would-be inventors—and each one is more committed to success than ever before; he is "the man of the hour"; we must give him every chance to succeed; and we must "translate his success into our success," Mr. Charpie said.

There are "enormous barriers to the success of innovation" built into the American economic and industrial system. We have only "capricious" ways to guess whether an innovation will in fact be successful. Tax

laws discourage individual innovators. Stock option rules cripple small companies trying to capitalize on innovations just when they are most vulnerable. And there are many other "small but not inconsequential inhibitions which prove that we do not understand how technological innovation takes place or how vital it is," Mr. Charpie declared.

Companies need to study themselves, the federal government should reshape its policies (present tax laws to encourage new technology "are only helpful to those who have profits to start with"), and universities—thus far aloof from the arena—have an "enormous opportunity" to help understand "the anatomy of the technologically based small company." Modern technology, in sum, makes economic progress "a whole new ball game," and Mr. Charpie wants us to learn some new rules.

Physics/Metaphysics

An electronic technician may be able to understand a new computer by looking at its input, its output, and its performance at a few key spots in between. But a similar approach to understanding the human brain—the assumption that an assembly of its parts will yield the whole—is nonsense, said Dr. Jerome Y. Lettvin, M.I.T. Professor of Communications Physiology, at a briefing session on new scientific horizons for 50 newsmen at Northwestern University this fall.

Television repairmen and brain surgeons are a little alike—each searches for a single deficient part in a complex whole. This kind of empirical knowledge is fine in its place, said Dr. Lettvin, but "it doesn't help me understand how the brain really works."

This is because the brain contains feedback loops that extend into the outside world: what a brain does and how it works depend on its environment and its accumulated experience. To accommodate these factors, said Dr. Lettvin, "we must free neurophysiology from the arbitrary and ridiculous restraints of physics; we must enter more poetic modes of thought."

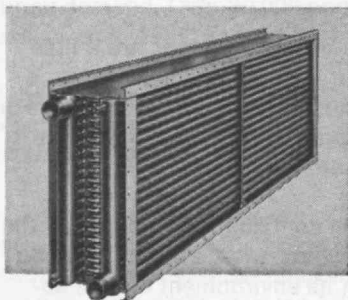
This is not to say that the laws of physics are inappropriate. Indeed, Dr. Lettvin agreed that physics so far



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provides us with the best statement we have of our physical world. Our new statements about the brain may not be derivable from the laws of physics, he said, though they must not contradict them. What he is trying to do, Dr. Lettvin insisted, "is to provide a metaphysical foundation for the science of neurophysiology."

Briefly Noted

Distortion for Intelligibility

Most people assume that the highest fidelity in the reproduction of sound provides the best communication. But John D. Griffiths, a U.S. Air Force Major who graduated from M.I.T. in 1954 and is now stationed at the Cambridge Research Laboratories, suggests that clearly comprehended consonants are the key to intelligibility. Most consonants are enunciated at frequencies higher than 400 Hz, and he proposes a microphone filter to raise the response about 3.5 decibels for each octave above 500 Hz. The resulting gain in intelligibility, he reports, is as if the transmitter power had been doubled.

A "Laggard" Response to the Urban Crisis

The universities' "ivory tower" arguments are serviceable enough in tranquil times. But, said John W. Gardner, Visiting Professor at M.I.T., to the American Council on Education this fall, attention "to the gravest domestic problem of our generation is not a diversion: it is the main show." He charged that the nation's colleges and universities have been "notably laggard" in their response to the urban crisis.

Stemming the Deficit

Harbridge House, Boston management consultants, has been helped by Harvard and M.I.T. faculty members in a study of the U.S. Merchant Marine's relationship to the balance-of-payments deficit: the Merchant Marine contributed \$7.3 billion to the deficit in the decade ending in 1967, but the payments deficit of \$23 billion "would have been 30 per cent larger without the significant contribution of U.S. vessels" in the same period.

Overdue Quake

Frank Press, Head of the M.I.T. Department of Geology and Geophysics, has told the Associated Press that there seemed to be no "chain-reaction relationship" between the summer's major earthquakes in the Philippines and Mexico. But, he said, "very few specialists doubt that California is building up for a big earthquake." Recent minor tremors indicate that the region is still "active" and the strain is mounting, according to his A.P. telephone interview.

The High Stakes of Congestion

"Our product has no shelf life," said M. A. Brenner, Vice President of American Airlines, in describing the airlines' scheduling problems to an M.I.T. air transportation seminar this fall. Every three and a half rows of empty seats on a New York-to-Los Angeles jet is equivalent to the price of a compact car, and "we either go when the customer wants to go or we go empty," he said. The congestion problem represents playing for high stakes.

Unseen Forces

How does a physicist "see" nature at work? How does he visualize the unseen concepts he manipulates every day? And how does he relate these to his daily life? Should the artist, perhaps, be the one who dramatizes the principles with which the scientist operates?

This is one line of thought which has been underway at the Center for Advanced Visual Studies under the tutelage of Takis, a 43-year-old Greek-born sculptor who, as a fellow at the Center, has been exploring extensions of kinetic art. And, in late November, the Hayden Gallery opened an exhibit of Takis' work which showed successfully how the force of magnets, light, and the oscillations of the sea can be turned to highly provocative results.

Takis' sculptures are not conceived as artistically self-sustaining units—so anyone looking for Beauty with a capital B should not see them. Instead, the intent is for the forms merely to illustrate the physical principles at work.

One piece of this "phenomenological sculpture," for example, causes two lightweight screens to be suspended in midair, quivering along the lines of force created by a magnet located halfway between them. While dramatic, the powerful black and white coloring scheme is less important to the sculptor than the clarity with which it demonstrates what is happening. The magnet itself is nearly invisible—it is black on a black backdrop. But you can see the effect of it: pure white screens rigidly in place against the same black backing.

Similarly the various pendulum sculptures, which use on-off magnets to make the two or more pendulums swing randomly, also subordinate more "aesthetic" considerations of color and form to the illustration of the principle. Quite typically, they are uniformly chalk-colored, with the exception perhaps of the lone needle or pendulum which is most actively swinging about. Takis has also utilized light, in a bouquetlike bunch of blinking lights on poles more reminiscent of a city street at night than of any physical forces. He has also experimented with deriving sculpture from the oscillations of the sea.

Yet in the relatively confined space of the Hayden Gallery, these constantly moving, blinking, burping, bleating pieces of form create a space which somehow resembles our own city environment. By crowding together all the units, operating noisily independently of one another, he has created—by the same methods even—something which could be termed "urban." Takis, then, is not far from the Renaissance masters who sought a "representation of life"; he has merely substituted "physical laws" for the general term, "life." And just as religious paintings of old could conjure up to the average viewer a "real" image of the Day of Judgment or the Annunciation, so a roomful of demonstrably moving, kinetic structures can produce a "vision" or replica of life on our own city streets. Many thanks to Mr. Takis.



When Vassilakis Takis put his magnetic sculptures on display at M.I.T.'s Hayden Gallery this fall, the New York Times found that they "flash, flutter, spin, swing, and screech like jungle birds." Then Robert Reinhold of the Times went on to describe more seriously how "an increasing number of scientists have been seeking collaboration with artists to . . . achieve greater scientific insight and creativity." (Photo: Owen D. Franken)

Coexistence and Convergence

Few thoughtful Americans now doubt that scientists have responsibilities to bring their intellectual method and human concern into the arena of public affairs. But the idea that a physicist behind the Iron Curtain may seek the same role for himself and his colleagues, thus forging a link between the Communist and Western worlds, has surprised and excited the U.S. scientific community this winter.

The Russian is Andrei Dmitriyevich Sakharov, whose essay on "Thoughts on Progress, Peaceful Coexistence and Intellectual Freedom" was first published in *The New York Times* as long ago as July 22, 1968. Since, the paper has circulated widely at conferences and universities in the West, and been published as a book with annotations by Harrison Salisbury, Assistant Managing Editor of the *Times*.

The paper is a remarkable Russian argument against the narrow confinement of the scientist in his own specialty, said Isidor I. Rabi, who is Compton Visiting Professor of Physics at M.I.T. this year, to an M.I.T. seminar this fall. Dr. Sakharov "exhorts us—professors and students—not to become confined in our specialization but to move into relationship with the total culture, contributing to it where we are most able and knowledgeable." Howard W. Johnson, President of M.I.T. who introduced Dr. Rabi at the seminar, said the Sakharov paper was significant because it plots a course toward ever-increasing collaboration without which "annihilation awaits mankind. We should spend a lot of time on this paper here at M.I.T.," he said.

A week later Harrison Salisbury came to the Institute to describe the long tradition of a Russian "underground intelligentsia" out of which such a document arises. It is a tenacious movement which has never surfaced nor expired, he said, and there is enough communication among its members so that the Sakharov document, though never published or referred to in print, is well known and understood.

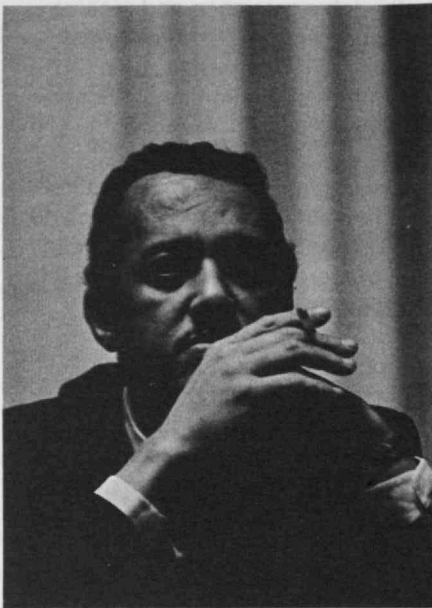
Indeed, at the same seminar Bernard T. Feld, M.I.T. Professor of Physics who had just returned from conversations with Russian scientists at the international "pugwash" meetings, said the Russian scientific community "resonated very strongly with the contents and tone" of the paper. There was "some disappointment," he said, that the document has not elicited "louder and more public response" in the West.

Mr. Salisbury called Dr. Sakharov's document "the biggest event in a rather bad year." It is a "blindingly brilliant contribution," he said, and he urged American scientists to respond with a list of their own priorities for human progress. Thus, he said, the convergence of West and East which Sakharov hypothesizes may, in fact, be fulfilled.

Depersonalization and Frustration

The lesson to be learned by America's academic communities from the election of 1968 is that young people and intellectuals—and the issues which intellectual and technological progress raise for the nation—are a new and potent force in American politics. Yet it is destined to remain—at least for the next four years—a frustrated thrust.

The so-called "new politics" is simply an expression for the position of people who represent "the forces of enlightened change," said Richard N. Goodwin, who was Special Assistant to President John F. Kennedy and political adviser to Senator Eugene J. McCarthy and later to Senator Robert



F. Kennedy, at a Karl Taylor Compton seminar at M.I.T. this fall. For these people, Mr. Goodwin said, "the war in Vietnam and the nation's racial problems are superficial evidence of a far deeper dissatisfaction." Their real quarrel, he believes, is with the growing effects of technology in our lives, with "what is happening to the community, to the environment, and to the power of people.

"These issues of the depersonalization of life," he said, "are the real and troubling ones, and they will not go away." The elections of 1968 revealed how broad is the base of concern for these questions, said Mr. Goodwin, and how serious a factor they will be in the next four years.

Robert Healy, Associate Editor of the *Boston Globe*, agreed with this view, and he went on to point out how real will be the competition among future political candidates for the votes of "young people and intellectuals." Yet there is another side to this coin: John S. Saloma, 3d, Associate Professor of Political Science, said that the 1968 conventions and elections revealed to him the strength of "the resistance of the political system to new demands. The 'new politics,' " he said "is in for a difficult period, in which we will see growing divergence between the expectations and the performance of the existing party system in the U.S." And in this situation, he added, it is not unlikely that the frustrations of young people and intellectuals will continue to be visited upon the nation's colleges and universities.

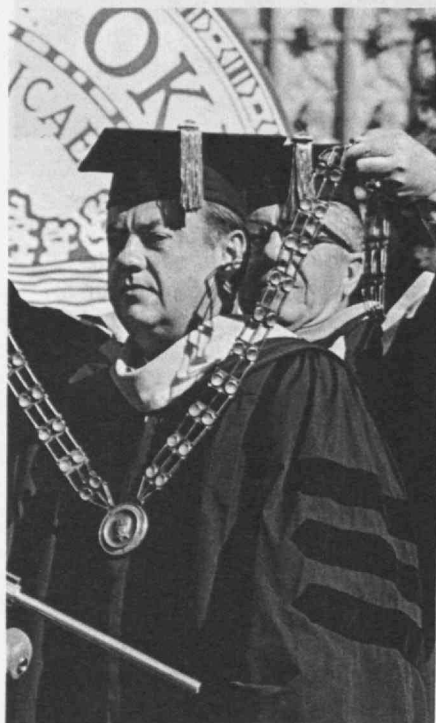
The University and Society (Renewed)

Richard N. Goodwin, who was the late Senator Robert F. Kennedy's campaign adviser, found an enthusiastic audience (above, right) for his proposition that in the next four years "a thoughtful electorate will find increasing frustration and alienation" in the American political system. With him on a Karl Taylor Compton Seminar platform at M.I.T. this fall were the Reverend Channing Phillips (left), the first black candidate for President of the U.S. ("Change for the sake of change is no change," he said) and Robert Healy, Associate Editor of the *Boston Globe* ("If I were a moderate Republican Congressman in Washington today I'd be a little uneasy."). (Photos: Owen D. Franken)

The issues before American universities in 1969 are not really so different after all: whether, and how, to respond to grave, short-term, "real-life" problems of society; or whether to contribute at the level of long-term basic understanding of man and his interrelations in the culture which he has built over past millennia. It is the debate from which M.I.T. was spawned a century ago as an advocate of "the dignity of useful knowledge." And it continues to govern much lively discussion in Cambridge (see *Technology Review*, Dec., 1968, p. 93).

The latest renewal of the debate occurred late in 1968 when a University of Oklahoma committee under the leadership of M.I.T.-educated J. Herbert Hollomon, former Under Secretary of Commerce, recommended that the University's colleges and institutes "should be more diverse in their concerns and methods and more flexible and responsive to change." Among its

Shortly before J. Herbert Hollomon was inaugurated as President of the University of Oklahoma this fall (below), he had reported as chairman of a study committee that there are nine areas through which the University should serve the state and nation: the role of reason and discipline, art and culture, ethics and philosophy, economic and industrial welfare, urban problems, the social environment, psychological and physiological health, nonhuman ecology, and international studies.



proposals: undergraduates should have on-the-job experience and receive academic credit for it; new colleges "with exciting and relevant concerns" be established around new "societal problems"; and that professional programs be expanded to include urban affairs, higher education innovation, and legal science.

Indeed, said the report published on the eve of Dr. Hollomon's inauguration as President of the University of Oklahoma, the institution must "be involved in active problem-solving for public goals and organize research and public service in important areas." And it should be prepared to put its findings into practice by entering into "venture relationships with private industry."

In reporting the University of Oklahoma's proposed new posture, *Time* magazine (November 1) also noted the concurrent statement by Jacques Barzun, former Provost of Columbia University, who complained that universities are turning into "public utilities . . . offering direct help to whoever is suffering now." And then others joined the new debate: Clark Kerr, Chairman of the Carnegie Commission on Higher Education, said it is simply a question of whether the universities "want to serve criticism and dissent or the *status quo*." Earlier, Harold Howe, 2d, U.S. Commissioner of Education, told Yale alumni that "it is at the peril of our university as well as our society that we seek a return to former isolation."

An Institute for Involvement

How can the issues raised by fundamental changes in political, economic public and educational life be studied when "academic social science has paid relatively little attention to most of them?"

The Cambridge Institute—a novel institution which has proposed that question—now aims at testing answers by opening operations in Cambridge in September, 1969; funding is adequate for at least a pilot year.

The Institute hopes to bring together "doing" and "theorizing," to offer an alternative to the "passivity, irresponsibility, and non-involvement" which characterize academic environments. The Institute's founders plan to recruit full- and part-time Fellows "who are committed to affecting events and who reject the widespread academic assumption that the only audience worth working with and writing for is one composed of scholarly colleagues."

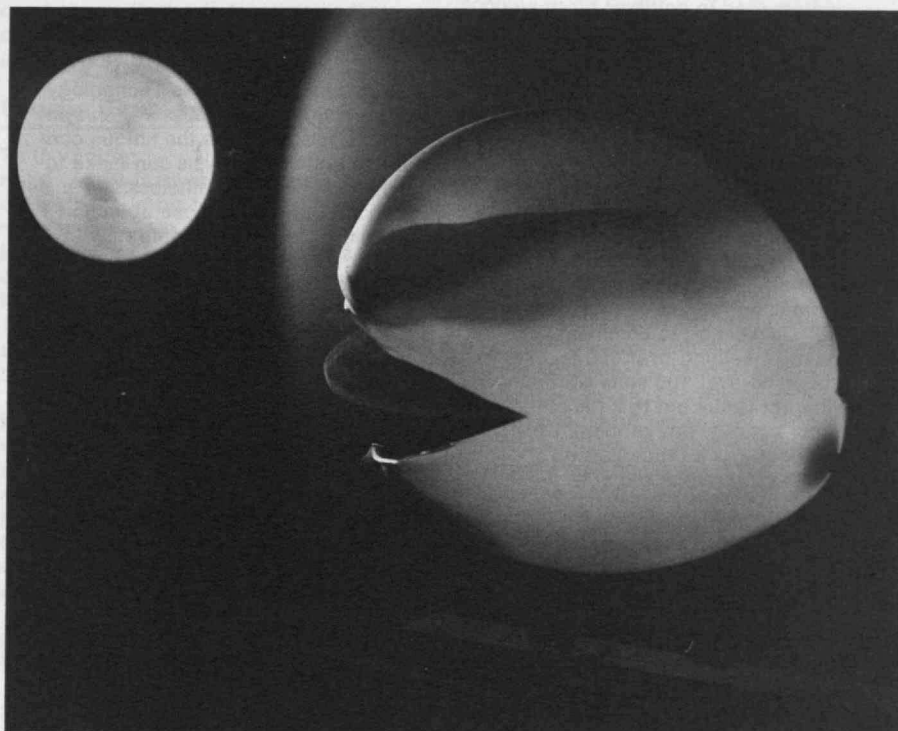
The Institute's Co-Directors are Gar Alperovitz, formerly at the Harvard Kennedy Institute of Politics, now a Fellow at the Institute for Policy Studies in Washington, D.C., and Christopher Jencks, a Contributing Editor of the *New Republic* and Lecturer at the Harvard Research and Development Center. Operations are planned to date in three main areas:

1. Development of a democratically controlled community development corporation in a predominantly white neighborhood in Cambridge as a "workable, self-help method to end poverty. In addition, there are possible plans for two parallel experiments in black neighborhoods to be carried out in co-operation with C.O.R.E." The aim of these projects is to offer some in-the-field experience for fellows and students while theories and policies are in formative stages.
2. Development of "new programs of graduate study and training in the social sciences," to create alternative routes to the Ph.D. degree.
3. Work "to encourage re-examination" of American foreign policy. "A substantial body of revisionist scholarship on the Cold War has accumulated in the past few years," says the Institute, "but the evaluation and criticism of these viewpoints has been largely confined to specialized scholars."

Other topics probably to be covered by the Institute umbrella are the legal, political, economic, and social organization of the neighborhood; housing and home ownership, regional development and government; and the changing nature of American conservatism and radicalism.

Strobe Probe

Harold E. Edgerton



This photograph of a bursting balloon was backlit with a half-microsecond flash. The crack has a velocity of about 300 feet per second.

What is the reason for the line in the crack?

Answer

The answer is not known, and readers are invited to contribute their hypotheses. Write to the photographer in care of *Technology Review*, Room E19-430, M.I.T., Cambridge, Mass., 02139.

Harold E. Edgerton is Emeritus Institute Professor at M.I.T.; he is widely known for imaginative uses of stroboscopy in high-speed photography and other applications.

The question of China's future is to develop a scientific civilization. Mr. Chairman has been a pioneer in understanding of what is happening in the world. The question is not only how to take into account the high technology, but also how to take into account the low technology. The question is not only how to take into account the high technology, but also how to take into account the low technology. The question is not only how to take into account the high technology, but also how to take into account the low technology.



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Correspondence Review

On Politics and Cities

To the Editor:

I have read with great interest Professor John F. Collins' article "Technology for the Urban Crises" in the July-August number of the *Review*, and I venture to comment on a few points.

Professor Collins says that running our cities cannot be left to the random operation of the political processes. However, we cannot, in a democracy, eliminate the political process. We may, however, be able to dilute some of the influence of the purely professional politicians. Probably I am speaking as an unreconstructed scientist when I say that the chief qualification for public office of too many politicians is their ability to garner votes. I see as a major weakness of city government that the legislature of the city is far too small to represent an adequate range of points of view. As I recall it, Boston has a nine-man city council. New York City, with a population of nearly eight million, tries to run on a 31-man legislature. Of course there are other problems; one certainly is that the average voter is ill-informed. It is the great strength of the Massachusetts towns that every voter, who is by law a legislator in most towns, is annually informed in print of every pertinent detail of the town's business for the preceding year. It may well be true that the city councilors and the mayor have information which the voters do not have, but the question is: Do they have better judgment than the mass of voters? I think any experienced teacher will agree that knowledge and judgment do not necessarily come wrapped up in the same human package.

Professor Collins refers to modernizing building codes. Of course, he knows perfectly well what the major problems are on this issue. Down here there has been a considerable use of trailers, which are semi-permanently implaced without wheels under them and which evidently produce a reasonably satisfactory and relatively inexpensive house for a small family. Not long ago I saw an account of what was being done in South America to improve the housing of the Indians. What is called a transitional house, apparently only of two rooms, is being built out of relatively inexpensive ma-

terials and costs about \$3500. Then when the economic status has been improved, the Indian can go on to still better housing.

Professor Collins mentioned the number of federal aid programs, and there are certainly many state programs. Perhaps he would agree with a mayor who spoke on "Meet the Press" some months ago. When asked what the mayor's office could do toward the co-ordination of programs, he replied, "Practically nothing." He went on to comment that there were something over 100 federal and something over 100 state programs operating in his city but that his office had no control over any of them. Certainly, if the mayor's office had no control, the city council did not.

I suppose Mayor Collins is also as aware as I am that most of the chairmen of congressional committees, especially in the Senate, come from small southern towns or from the country. We must remember in connection with this that there are no relatively large southern cities. Charlotte, with a population of 201,000, is the largest city in either of the Carolinas; and only two other cities in North Carolina exceed 100,000. It was pointed out not long ago that New York City for the first time in more than a quarter of a century was adequately represented in the state legislature. When I took civics in New York some 50 years ago, our instructor pointed out that New York City, which had half the population of the state—as it still does—had 30 per cent of the representation in the legislature and paid 70 per cent of the tab for state government. As far as the up-country legislator was concerned, the only function of the city was to support state government. This was possible because of a gimmick in the state constitution which limited the number of representatives from two adjacent counties. At that time the city consisted of four counties.

It has even been opined in "Letters to the Editor" down here that rural people are the only people sufficiently decent, moral and Christian to be trusted with political power, while city people are inherently dishonest and evil.

Charles H. Blake
Hillsborough, N.C. 27278

Management Conformity?

To the Editor:

Arnie Amstutz' article (see *Technology Review*, Oct./Nov., 1968, p. 46) on systems analysis suggests the unique contribution systems analysis can make to city management. Nonetheless, his analysis tends to reinforce those objectionable tendencies toward conformity in output in management which we should be able to diminish if we view the systems problem in a slightly different way. His example of the Health Services Administration is adequate to service this modification in emphasis. His discussion of the Elements of the City Health System seem to ignore the point I'd like to have seen him make.

Amstutz' Health Services Administration works with patients identified from a population pool. What this simple statement reflects is a cultural definition of patient and nonpatient which needs examination. We have begun to worry about the definition of economic roles in a post-industrial society. Shouldn't we re-examine the notions we have about "patients" and the nature of "health" that various groups in the population are interested in pursuing?

All this may be a complicated way to say that bureaucracies must learn to recognize the varieties of cultural patterns among the population. One man's treatment may be another man's poison, as we found in urban housing policy. A critical relationship exists at the point where output is related to population. If a number of us can't relate to the vendor of all these wonderful services, it's money (and analysis) down the drain.

Richard McDowell
Newton, Mass. 02168

Professor Amstutz comments as follows: If I correctly understand Mr. McDowell's point, he is concerned with the establishment of a broad interpretation of "health services" and a sensitive definition of "health needs." In discussing the utilization of systems developed through systems analysis I note the six functions which would be performed. These include monitoring the health status and determining the health needs of the population, and evaluating the

quality of medical care and health facilities available to the population.

The point to be emphasized is that the system makes it possible for the executive "... to concern himself with broader policy problems which he will approach with increased effectiveness because he has more meaningful data and a better (model based) understanding of his environment. Much of his time will be spent in increasing his understanding of the environment and refining his insights. ..." The system permits the manager to take a broader and yet more refined view of existing and potential future health services. Through the systems analysis process the insight and perceptions of a sensitive administrator can become the basis for systems that enable him to better "relate" to the population he is trying to serve.—Ed.

Croctic Double-Crossed

To the Editor:

Happy is the man who knows his level of competence in his field of endeavor: but blessed indeed is he who appreciates his limitations in another man's discipline. The Technological Double-Croctic (see Technology Review Oct./Nov., 1968, p. 94) has provided me with a lesson in intellectual humility; perhaps we both can profit.

My confidence soared when I was able to write in "moment of inertia" with no contextual aid from the diagram. As the message took form, I chortled, "Aha! Heisenberg and his famous Principle!" Imagine my embarrassment when my wife, from a more vertical frame of reference, informed me that the proper reference was *The Theory of the Properties of Metals and Alloys* by Nevill Francis Mott and H. Jones.

Such chagrin can be matched only, if at all, by the author of the puzzle who used, in a word game, a nonexistent word. As a chemical engineer employed by an oil company, I was disturbed that I could not guess the word for "petroleum." Vindication was sweet, however, when the blanks for row J became filled with the letters "NAPTHA," which apparently stand for the word whose correct spelling is the direct transliteration of the Greek $\gamma\alpha\phi\theta\alpha$.

George A. Randall, Jr.
Chicago Heights, Ill. 60411

How Does Science Begin?

To the Editor:

Because Mr. C. H. G. Oldham's article on "Chinese Science and the Cultural Revolution" (see Technology Review Oct./Nov., 1968, p. 22) is so well informed and so cogently argued, I particularly feel the need to look very slightly further into his speculation that "although historically China has made many technological innovations, her scientists never discovered the 'scientific method.' ... At least part of the reason [for the absence of a Scientific Revolution] probably lies in the nature of Confucianism, whose

advocacy of the *status quo*, its veneration of tradition, and its belief in an hierarchically ordered society are the very antitheses of the values implied by science."

The question of China's failure to develop a scientific revolution out of her own necessities until the last century is, as Mr. Oldham has seen, central to our understanding of what is happening inside that unknown country (that great void in our consciousness) today. But how do we take into account the fact, so voluminously documented by Joseph Needham and his co-workers, that traditional China was hardly less innovative in science than in technology, and that what modern science is displacing is a 2000-year-old tradition of both mathematical and "soft" sciences? I ask this because I think that "scientific method," despite its currency in discussions of this sort, is a red herring.

I am sure that Mr. Oldham in his own scientific work never discovered anything by following the steps transmitted via Galileo (who never followed them) from Robert Grosseteste, in whose time (early Thirteenth Century) these steps had failed to lead to modern science. The idea of the scientific method would have died out two centuries ago had it not come to serve a certain purpose in popularization—not so much for teaching people about science as for securing their assent to it. If I were looking for reasons which come out of the character of science itself, I would give much more weight to the complete absence in China of the notion of rigorous demonstration, of proof.

But that is clearly, as the author sees, not the whole story, for science, traditional or modern, exists in society and generates values which determine directions of social change. I am puzzled by Mr. Oldham's implication that those values must already be established in order for modern science to begin. Where does one find in the writings of the founders of modern science anything to indicate that they expected science to change society, or even wanted society to change? To the contrary, considering how early it was seen that science could have technological applications, I have always been astonished how alone Galileo stands in even suspecting that the *status quo* might be affected.

Professor Doak Barnett's position, in his article "Mao versus Modernization," (Oct./Nov., 1968 p. 30) seems to me more cogent, except that I would tend to see certain basic features of the "red vs. expert" issue much further back than the Nineteenth Century. The distinction between the generalist, the gentleman civil servant, qualified by his Confucian indoctrination to speak to questions of purpose and value, and the staff expert, who remained in the background and supplied techniques as they were asked for, was basic in imperial China for over a millennium, and is far from dead in Taiwan today. This is only one of what I am sure will ultimately be

a broad constellation of factors, the rest of which will remain unknown until we have become much more sophisticated in our comprehension of the growth of science as an integral part of culture and society in both East and West.

It is absurd to think of Mao as just the latest Chinese emperor. But the minds of the majority of China's ruling elite (at last notice) were formed in the matrix of traditional social institutions and values. It will inevitably be some time before history has become irrelevant.

Nathan Sivin

Associate Professor of the History of Science, M.I.T., Cambridge, Mass. 02139

For Vigorous Protest

To the Editor:

I was dismayed to find in your October/November (p. 91) issue a letter from Argo E. Landau, questioning the propriety of heaping honors on Noam Chomsky, who has been an outspoken and very effective critic of our war in Vietnam. Let me say that Professor Chomsky was undoubtedly the most impressive teacher of the many fine teachers it was my privilege to have as an undergraduate, and the fact that he feels the overwhelming necessity to protest as vigorously as he can our country's bizarre international activities can only make him more of an asset to M.I.T.

Mr. Landau is unhappy with the comparison of the United States of today with the Germany of the 1940's, but has he not at some time wondered why the "good" Germans did not publicly resist Hitler's evil regime? In the face of the extraordinary crimes against humanity which have been perpetrated by "us," it should be reassuring to Mr. Landau that there are a substantial number of Americans who are deeply concerned about what we are doing to the people of Vietnam.

Could Goebbels' propaganda machine have subverted ordinary language to any greater extent than it has been by those Americans who have produced such gems of "newspeak" as "pacification" and "peace offensive"? Perhaps even Mr. Landau will appreciate the sickening hypocrisy of the following Associated Press release of October 30, 1968: U.S. JETS CONTINUE BIG RAIDS/More Peace Rumors Flying/American fighter bombers kept up their heavy raids across North Vietnam's southern panhandle today amid growing speculation that President Johnson's peace offensive is reaching some sort of climax."

One need not be a world renowned linguist, such as Professor Chomsky, to be nauseated by the obvious prostitution of meaning that goes on daily in both official and nonofficial news releases. The only question is how far away we are from serious discussions of "the final solution to the Vietnamese problem."

John H. Kusmiss
Kalamazoo, Mich.

Tech-Crostick

David L. Holt

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Use the definitions at the right to help define the words to which they refer; then enter the appropriate letters in the diagram to complete a quotation from a well-known figure. The first letters of the definitions give the author and title from which the quotation is taken. Black squares in the diagram indicate the ends of words; when there is no black square at the right end of the diagram, the word continues on the next line.

For the correct solution bearing the earliest postmark from *each state* in the U.S., *Technology Review* will award one copy of The M.I.T. Press Paperback *Reflections on Big Science* by Alvin M. Weinberg. Send solutions and comments to Dr. Holt in care of the Review, Room E19-430, Massachusetts Institute of Technology, Cambridge, Mass., 02139.

David L. Holt is Assistant Professor of Metallurgy at M.I.T.

A. An important iron ore which is red when powdered.
B. To combine with oxygen.

C. Unit of energy (2 words, comp.).

D. Human in form.

E. Flat object having power to deflect rays of light (2 words).

F. A nonconducting material.

G. A quick puff or slight gust of air, smoke, vapor, etc.

H. Biblical character (3 words).

I. Instrument for viewing the interior of the eye.

J. Birds of prey.

K. The second covenant of God with man (2 words).

L. Computer accessories.

M. To vibrate, fluctuate, swing.

N. Mother-in-law of Ruth.

O. To subject to torsion.

P. To this place and that (3 words).

Q. Female sheep.

R. Past M.I.T. President from New Zealand.

S. Saturates, tinges deeply.

T. Not enough, insufficient number (2 words).

U. With his permission (3 words).

V. What an early riser is (4 words).

W. See word Z₁ (4 words).

X. The Decalogue (3 words).

Y. King of England, 978 to 1016 (3 words).

Z. The exchange of labor for goods instead of money.

Z₁. Why Polonius advises against borrowing (3 words preceded by word W).

Z₂. Department in School of Science, M.I.T. (4 words).

85	234	4	152	243	51	165	213	
186	23	220	91	11	267	180	53	145
106	15	143	276	242	80	135	195	20
	161							
65	12	182	270	187	250	24	287	173
	198	31	261	224	86	217	285	
99	121	214	170	19	115	282	258	89
	210	289	134	76	63			
150	230	94	237	255	290	140	196	62
	207							
178	252	127	97	69				
278	190	104	142	211	57	273	113	48
	37	1	156	110	8			
38	130	249	82	71	138	32	240	176
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227	25	199	181	64	83	13	119	209
	168	281	46					
158	193	122	109	185	30	254	22	
245	260	125	136	66	149	155	6	118
52	162	239	163	43				
126	248	141	228	17				
179	284	75	101	35	132	88	160	268
	192	212	5	111	54	174	148	
184	146	129	7					
117	215	200	288	131	232	263	41	16
226	194	42	202	274	28			
133	201	277	123	72	84			
95	47	257	59	56	218	206	107	128
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188	208	294	39	221	191	265	203	147
	60	171	272	286	279	219	183	
44	253	269	291	222	73	116	246	58
	259							
236	27	144	225	61	34	90	21	231
	244	124	78	139	157	241	164	204
	296							
70	271	103	292	33				
45	229	251	3	67	153	266	295	10
	177	197	264	96	93	79		
49	166	223	175	74	256	102	68	120
	159	81	169	154	92	98	189	40
	26	55	114	108	238	105		



Technological Crossword

The correct solution to the Technological Crossword by John M. Sandor published in *Technology Review* for December (p. 103) is shown above.

Correct solutions bearing identical early postmarks have come from two *Technology Review* readers, Fred G. Hill, Brookline, Mass., 02146, and George M. Zriny, Berkeley Heights, N.J., 07922. The *Review* will award one-year subscriptions of publications of M.I.T. students to each; anticipating his success, Mr. Zriny specified the *Industrial Management Review*, and Mr. Hill's choice is being determined.

Puzzle Corner

Allan J. Gottlieb

Hi. Several readers have asked why their proposed problems have not appeared. The answer is quite simple: I have a rather large backlog of questions, some submitted nearly a year ago, and it will take time until I am able to print any sent in this year. But I am certainly not complaining; rather, I consider it an honor that you take the time to send so many. (I am, however, running low on bridge problems—enough said?)

I now understand how L.B.J. must feel being a lame duck. My ankle is sprained, and I hobble around the math building with a limp. But since math types don't actually "do" anything (so says my girl friend), I have managed to survive.

My biggest success in math has been in the book department. Among the graduate students at Brandeis it is considered a sign of great wisdom to own an impressive array of math books (even if you can't understand a single page). One of my friends at the office owns both volumes of Zariski, thus making him twice as smart as I with my humble volume I. The fact that he knows infinitely more commutative algebra than I do is not as significant as the fact that he owns the two volumes. Well, I still don't know any commutative algebra but I just bought volume II and feel very wise indeed. Now do you see why my girl friend says math types "do" nothing?

Problems

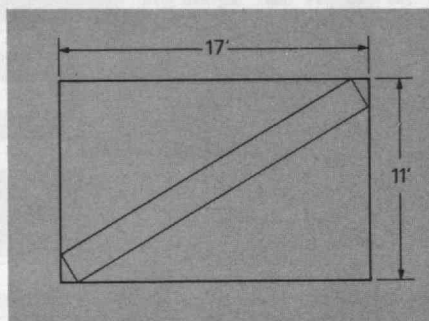
The answers to this month's problems will appear in the April issue.

John E. Prussing (M.I.T.'62) has a problem similar to one we have seen before:

11 Find the range of positive values of x such that, given x , the only positive value of y which satisfies $y^x = x^y$ is the trivial solution $y = x$. For those values of x for which nontrivial solutions for y exist (e.g., $x = 2$, $y = 4$), how many solutions are there for a given x ? If a value of x is selected at random from the open interval $(0, e)$, what is the probability that a nontrivial solution for y lies in the same interval?

The following comes from H. G. Holder-ness of Texas A & M:

12 Given a two-foot-wide carpet laid so that all four corners touch the four walls of a room 17 by 11 feet (see the drawing below), find the length of the carpet.



Steven Scott, the son of John H. Scott, Jr. (M.I.T.'43), wants you to . . .

13 . . . set up all 32 chessmen on the board so that each one has at least six legal moves—except pawns, of course. Bishops belonging to each player must be on different colors. One king may be in check but not both. Pawns may be placed in the first rank but not in the eighth rank.

John W. Langhaar of Kennett Square, Pa., writes, "A friend has recently been passing along copies of the Puzzle Corner from *Technology Review* since I am involved in a somewhat similar column for *The Bent* of Tau Beta Pi. We swipe problems from any available source and acknowledge the source as best we can. I find your column stimulating, but I must admit to not attempting some of the problems because I belong to the pre-Hilbert-space-set of college students. A problem which caused some controversy and which has many interesting features not immediately apparent is the following:

14 Let $n_1 = x^x$, $n_2 = n_1^{x^x}$, . . .

$n_i = (n_{i-1})^x = x^{x \dots x}$
and let $N = \lim n_i$ as i grows large beyond bound. Do real values of x exist for all positive N ? If so, what is the relationship? If not, what are the limitations?"

The final problem comes with a nice letter from Carole A. Clarke, Secretary of the M.I.T. Class of 1921: "Since I have always been interested in mathematical

recreations, I have for years urged Editors of *Technology Review* to run a regular puzzle section and expand the popular sets of puzzles which have appeared occasionally over the years. I cannot claim any credit for having worked on the present Editor to this end, but yours has been an excellent feature of the *Review*—although I must admit that I find most of the items too tough to handle. I have been awaiting an appropriate new problem to come along for your collection. The following, sprung on me by my son, Alfred L. Clarke (University of Pennsylvania Wharton School '54), has stumped quite a few people and I don't believe you have used one like it:

15 This is a logical set of numbers, mathematically derived: 10, 11, 12, 13, 14, 15, 16, 17, 20, 22, 24, 31, 100, —, 10,000. What is the missing number?"

Speed Department

SD5 If a chicken and a half lays an egg and a half, how many eggs do six chickens lay in six days? (Your first answer is probably wrong.)

SD6 Here is an old *Voo Doo* puzzle: How many M.I.T. janitors does it take to change a light bulb? (Answer: five—one to hold the bulb and four to turn the ladder.)

Better Late Than Never

32 The published answer is incorrect. The problem: A cow is tethered to the corner of a square barn in a level field. The length of the tether equals the perimeter of the barn. The cow can graze over just one acre. What is the size of the barn, "give or take" a small decimal fraction? George Piotrowski, '64, presents the following:

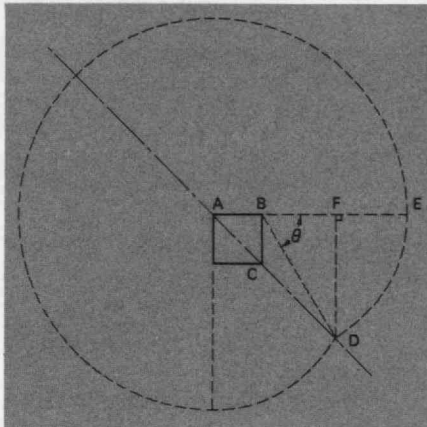
The grazing area of the cow must be symmetrical about the diagonal of the barn which passes through the corner to which the cow is tethered. The grazing X corner is delineated in the sketch on the next page, and the solution of the problem proceeds as follows:

We know that
AE = 4a
BD = BE = 3a
BC = AB = a

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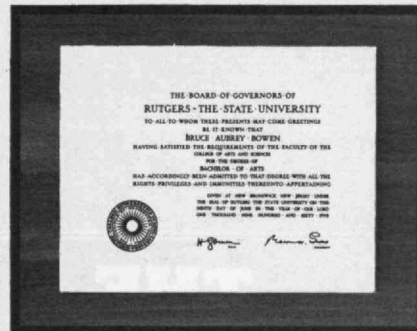


Let $x = BF$, then
 $AF = DF = x + a$
 For triangle BFD, by the Pythagorean Theorem,
 $(x + a)^2 + x^2 = (3a)^2$
 Solving for x we find that
 $BF = (\sqrt{17} - 1)a/2$
 We can also find θ to be
 $\theta = \cos^{-1}(\sqrt{17} - 1)/6$
 The total area is given by
 $3/4 [\pi(4a)^2] + 2(\theta/2\pi) [\pi(3a)^2] + 2(BC \cdot BF/2) = 1 \text{ acre.}$
 Solving for a gives the length of a side of the barn to be 29.98 feet.

Mr. Piotrowski was not alone; there were also corrections from John L. Freeman, '58, Stephen G. Hovemeyer, '70, Brian R. Kashiwagi, '64, Henry C. King, W. B. Ladd, Thomas D. Landale, S.M.'54, Mark Lively, '69, Benjamin Madero, '06, William T. Moody, '31, Donald G. Parrish Jr., '51, Frank Rubin, '62, John T. Rule, '21, John G. Ryan, S.M.'60, Herbert G. Shaw, '13, James W. Shearer, '45, Robert D. Shooshan, '48, Waite H. Stephenson, Jr., '45, William H. Wannamaker, Jr., '30, Jerry Wolf, David A. Wright, and Mark H. Yu '70.

Mr. Gottlieb, who graduated from M.I.T. in mathematics in 1967, is a teaching assistant at Brandeis University. Send answers and problems to him at the Department of Mathematics, Brandeis University, Waltham, Mass., 01254.

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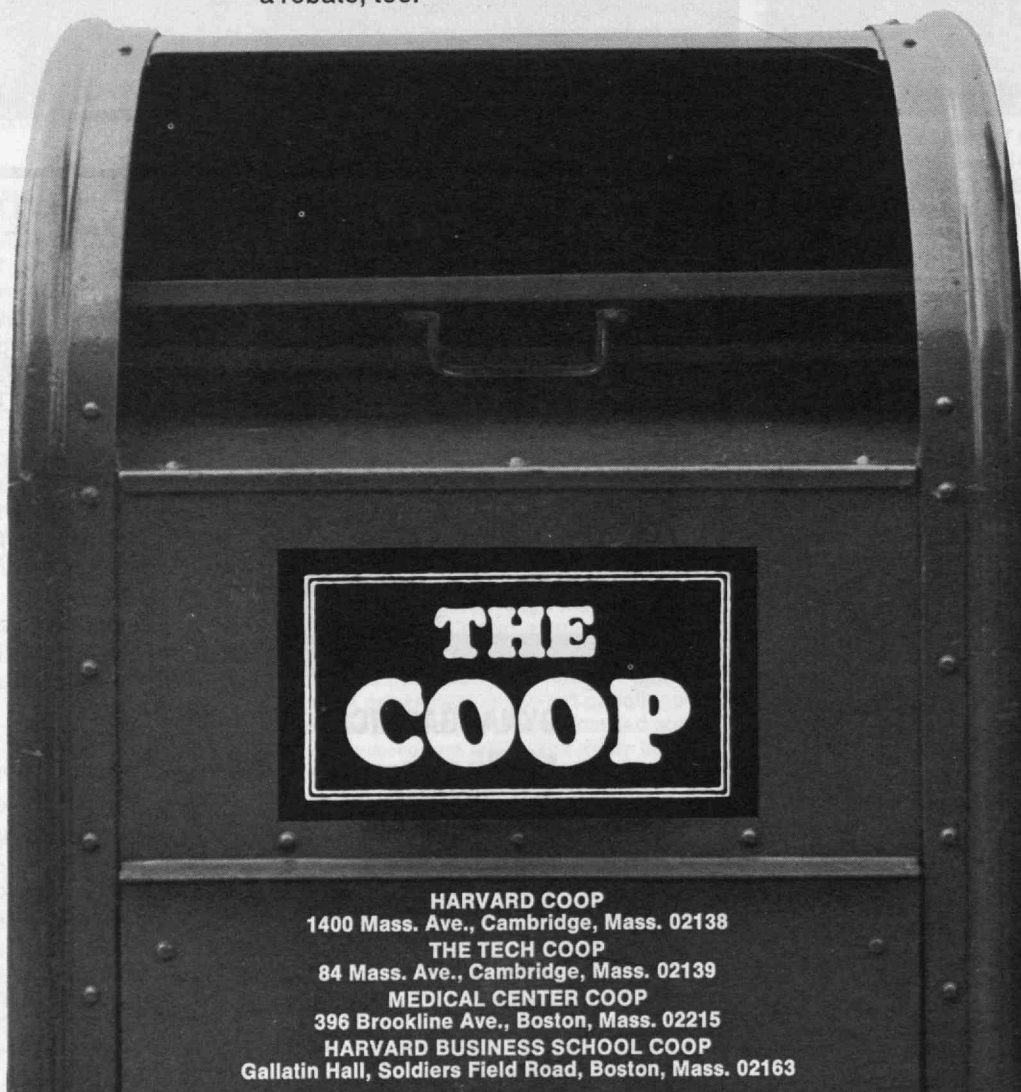
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Frederick G. Lehmann, '51, Secretary

Institute Review

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Institute Review

It's All in the Family

"The student activists I know are, to a man, almost boringly sincere," said one member of M.I.T.'s religious counseling department to the M.I.T. Matrons in mid-November. "They've taken everything we've taught them seriously and literally, and a lot of other things go by the board while they try to make their ideals come true."

The panel of officials who spoke to the Matrons on everything from *loco parentis* to community relations featured Kenneth R. Wadleigh, '43, Dean of Student Affairs, James Sessions, Religious Counselor, Joseph F. Lynch, Manager of Burton House, Richard A. Sorenson, Assistant to the Dean, and Dr. Carola B. Eisenberg, staff psychiatrist who was substituting for Dr. Benson Snyder, Chief Psychiatrist.

"After all," said Mr. Sorenson, picking up the theme opened by Reverend Sessions, "when I was growing up we were taught that the way you made your ideals come true was by playing the game. But these kids don't believe that; they want literal implementation of their goals even though we never set up any channels for this." On the subject of drugs, Mr. Sorenson said that parents should "not talk about what should be done, but we should instead just recognize that it's going on everywhere." He advocated dealing with drug offenders in ways that were "neither punitive nor harsh." He also said that many young people feel that alcohol is to their parents' generation what marijuana is to their own group. When one of the women asked the panel to express their opinion on whether the present marijuana laws should be changed, the panel unanimously said they agreed that the present Federal laws were too severe.

On the subject of student-administration relations, the discussion provoked some other interesting results. One mother told how angry she was with her college-age children for "asking for more breaks after already getting so many." Another mother suggested that the permissiveness young people expect from deans, teachers, and parents represents "a form of dishonesty with themselves." Burton House Manager, Mr. Lynch, sug-

gested that "these people really do want guidance and direction from us. They know they are not as self-reliant as they say. Thus, if we don't take actions in certain cases, we are failing them."

Dean Wadleigh said that the thing which most often he found hard to take was not rule-breaking or the offenses themselves, but rather, "getting a signal from a student which says, 'I don't trust you.' To help any situation where people are involved," he said, "you need a basis of trust and communication."

Finally, the panel pointed out to the Matrons that discussing their mutual problems together was helpful, since both Matrons and administration were together "all in the family." One panelist told of a group of workmen in a Boston cafeteria who objected to the presence of some students in the same cafeteria with them. "There is a tremendous amount of anti-university, anti-faculty feeling among nonuniversity parts of society, and perhaps by talking together, we can think about how to get at this problem," he said.

Class of 1922 Professor

Paul E. Gray, '54, Professor of Electrical Engineering, is the second member of the M.I.T. faculty to hold the distinguished Class of 1922 Professorship; he succeeds John Wulff, Professor of Metallurgy, Emeritus, who retired last June after a 37-year career in teaching and research.

Professor Gray's recognition as a distinguished teacher at M.I.T. began with an award for Excellence in Teaching from the Department of Electrical Engineering during his first year as an

instructor, in 1958. Since then, according to Gordon S. Brown, '31, Dean of the School of Engineering, "numerous students have said that they decided on careers in electrical engineering because of the excitement that Professor Gray's teaching aroused in them and the vistas that he unfolded."

After serving as Chairman of the Freshman Advisory Council and as Associate Dean of Student Affairs, Professor Gray was named Assistant Provost of M.I.T. a year ago, with specific responsibility for co-ordinating and developing the undergraduate curriculum and, in particular, for the educational opportunities available to students in the first two years at M.I.T.

The Class of 1922 Professorship was established on the occasion of the fortieth reunion of the Class. Its members specified that the occupant of the chair should "devote not less than 50 per cent of his time in teaching or in his preparation therefor."

Mauzé Professor

Dr. Rita Levi-Montalcini, distinguished neurobiologist who is Director of the Center of Neurobiology at the Instituto Superiore di Santa in Rome and Professor of Biology at Washington University, St. Louis, will serve as Abby Rockefeller Mauzé Visiting Professor at M.I.T. for the period from April 3 to 16, 1969.

Professor Levi-Montalcini will be associated with the Department of Biology at M.I.T.—lecturing, teaching, and participating in research, and in addition, she will meet informally throughout her stay with many groups of M.I.T. students. A native of Turin, Italy, Dr. Levi-Montalcini, a U.S. citizen since 1956, studied at the University of Turin and remained to specialize in psychiatry, neurology, and anatomy. Later she served as research associate in neurology at the University of Brussels before joining the Department of Zoology at Washington University.

The Abby Rockefeller Mauzé Professorship was established in 1963 by gifts from Laurance S. Rockefeller and from the Rockefeller Brothers Fund to bring to the M.I.T. campus distinguished women

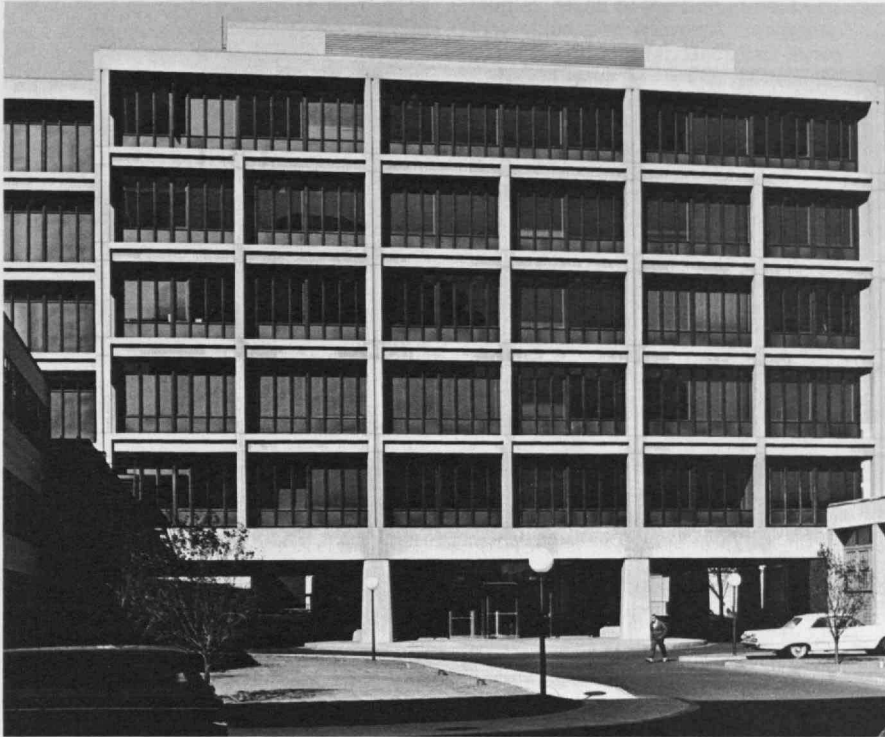


Paul E. Gray, '54



Dr. Levi-Montalcini

Over 300 members of the 1968 Alumni Seminar (see page 82) were among the guests of honor when M.I.T.'s new Information Processing Center was dedicated by Thomas J. Watson, Jr., Chairman of I.B.M., on November 11. The building (left, below) designed by Skidmore, Owings and Merrill, is immediately east of the Center for Space Research on the M.I.T. North Campus. Following the dedication luncheon in the Student Center, Mr. Watson joined M.I.T.'s President Howard W. Johnson (left) and Richard G. Mills, '54, Director of the Center, on a tour (right, below) of the new building.



scholars who would inspire the women students at M.I.T. as well as enrich their professional education. It honors Mrs. Mauzé, the only daughter of the late John D. Rockefeller, Jr.; she has been a leader in advocating advancement of women in the professions, the arts and business.

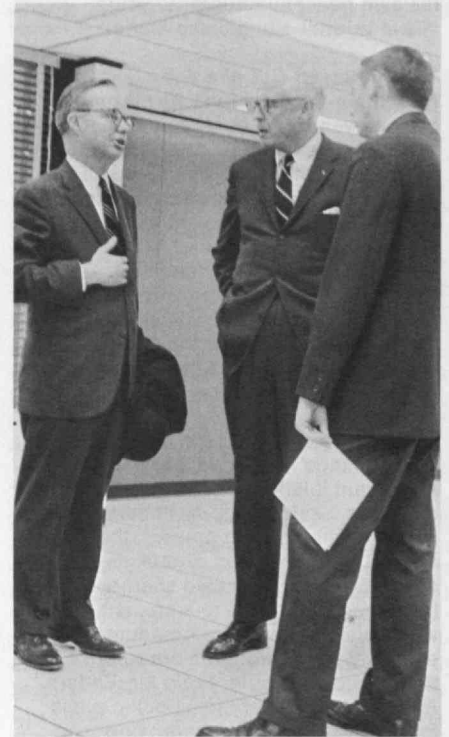
I.B.M. Chairman Dedicates a Computer Center

None of the promises for economic and social gains that may be realized by the resources of M.I.T.'s new Information Processing Center will come to fruition "if we attribute to the technological wonders of the world—the computers and other marvelous machines of our time—more abilities, more potential, than they really have." This was the judgment of a man whose company was a major contributor to developments at M.I.T. which have culminated in the Institute's new Information Processing Center—Thomas J. Watson, Jr., Chairman, International Business Machines Corporation. His ad-

dress on computers at the 1968 Alumni Seminar served as the formal dedication of the Center on November 11. Of computers, Mr. Watson said: "We will be making a profound mistake if we ever consider them or use them as more than tools . . . A machine cannot speculate as human beings do, and such speculation is—and I believe forever will be—outside the power of a computer . . . Machines can never handle our destiny or even make simple decisions of morality. But used as the wonderful tools they are, they can broaden and enrich our lives . . . We must resolve to remain the masters, not the servants, of our inventions."

Acknowledging Mr. Watson's dedicatory address, Howard W. Johnson, President of M.I.T., noted also the contributions of the Kresge Foundation, Olivetti Foundation, Computer Usage Company, and National Science Foundation to the new facility.

As the central component of a developing campuswide network, the



Center seeks to meet the teaching, research, and administrative requirements for information processing of all members of the Institute community. It houses an extensive I.B.M. System/360 complex comprising a Model 65-40 Attached Support Processor System and a Model 67. Available, as well, is a specially modified I.B.M. 7094 installation which has been providing general-purpose time-sharing to the campus and to a group of participating New England colleges since mid-1963.

M.I.T.'s growing, campuswide computer capability now includes, in addition to the Center, some nine distinct computer facilities located near user "clusters." In this way, some of the specialized local needs of the community can be met with small or specially tailored computers. Such local facilities are backed up by the large general-purpose center installation. Using the same concept, M.I.T. is participating with more than 60 colleges and universities in New England, in the development of regional computer capabilities.

The Trials of Maria

One of the major contributions of M.I.T. to management science and the related arts has been the change wrought by a self-possessed, bespectacled architect co-ed from Willowdale, Ontario, Canada, whose interest in environment led her along a somewhat winding path to take over the reins of student government at M.I.T. last spring. She is known to the Registrar's Office as Maria L. Kivisild, age 20, Class of 1969, but by now nearly every student on campus knows her by sight as "Maria." "Everything on the student scene here was quiet; student government just ran on its own steam," said one of the younger members of the Dean's staff, recalling his own peaceful undergrad years. "That is, until along came Maria!"

Voting Herself Out of a Job

Now three-fourths of the way through her one-year term as Undergraduate Association President (U.A.P.), Maria has been at the focus of a series of recent upsets over the role and organization of student government at M.I.T. In the last six weeks, several forums open to the entire student body debated reorganization. Earlier, to provoke the issue, Maria staged a walkout at an Inscomm meeting after the group refused to vote Inscomm—and the position she holds—out of existence.

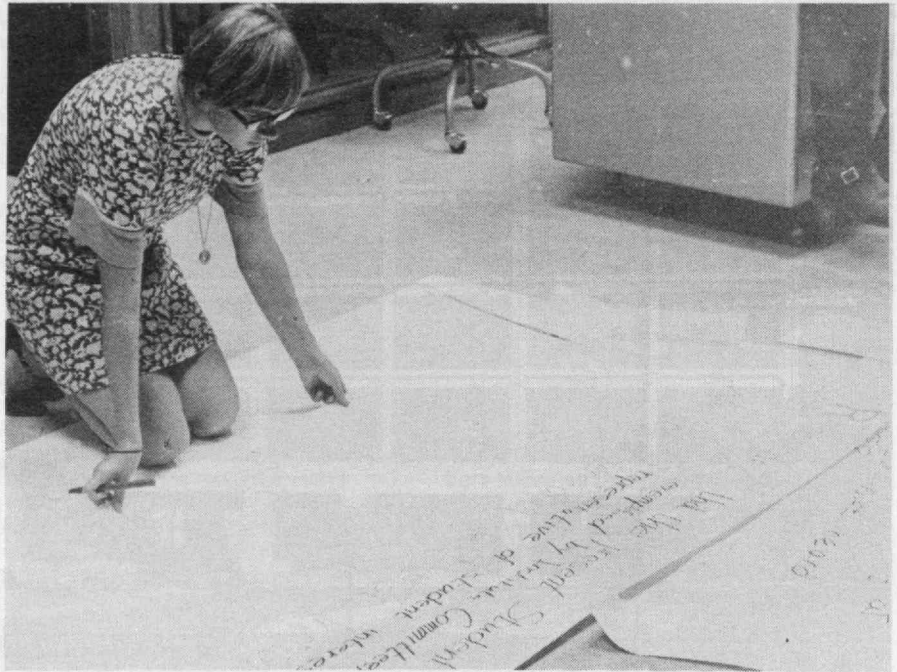
"Most people in Inscomm do feel that some change is needed, but they don't agree that it is Inscomm which needs changing," said Bruce A. Enders, '69, Inscomm member. At present, there are several reorganization proposals under consideration. Maria said she hoped to have them submitted to a student-wide referendum. "A referendum would probably push through more reforms than Inscomm would," said Mr. Enders. At present, there are no specific plans for voting on reorganization; however, Maria said she hoped the issue could be resolved before the end of her term as U.A.P.

One proposal, called TANG (Towards a New Government), would have a large General Assembly made up of undergraduate and graduate students who would elect their officers and appoint committees, both *ad hoc* and permanent. The TANG proposal includes elaborate arrangements for funding and for emergency meetings. Another proposal is the "town meeting plan," which would have faculty, graduate students, and undergraduate students meet once a month to decide on policies which an altered executive Inscomm would carry out.

M.I.T. Will "Give Us Anything We Want"

M.I.T.'s student government situation is "unique," Maria said. "What I understand about most other schools is that their student governments are very structured, but ours is very free. At other colleges, students are very concerned about getting power. But our administration will give us just about anything we want. So we don't have that problem."

"Resolved, that the present student government, exemplified by Institute Committee, is not representative of student interest . . ." Maria L. Kivisild, '69, President of the M.I.T. Undergraduate Association, finds the revolutionist's frustrations so great that she proposes to legislate herself out of an office. (Photo: George J. Flynn, '69, from The Tech)



Instead, at the heart of student government's present troubles is a word she said she doesn't like—apathy. Or a better word to describe it, she said, would be communication. "Really, my biggest problem is students.

"My philosophy, I guess, is to get more output from the average student by getting him to do something," she said. And getting people to do things and relate to each other is just the issue. Does Inscomm truly represent campus opinion? Why don't more students get involved? How much do Inscomm and other government organizations really accomplish? "Almost to their own regret, the Sanctuary (see Technology Review, Dec., 1968, p. 106) helped Inscomm realize the poor position they are in now," Maria said. "We met four times during the Sanctuary, and had to make real decisions, which would have immediate effect. Those meetings were very different from our regular ones."

But now Maria admits she is experiencing the full range of frustrations of the

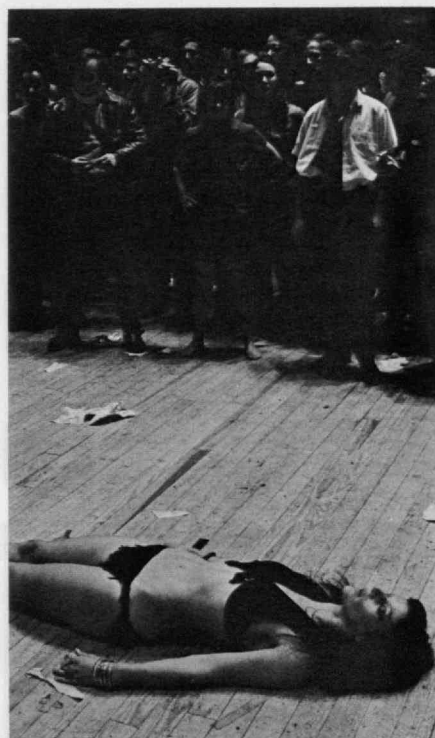
classic revolutionist. With typical understatement, she tried to summarize: "To tell you all the frustrating things about this job would take a very long time."

Food: Safe and Unsafe

It was a "jolly good meal," but those who enjoyed it might still be in fear for their lives were it not for the pioneering work of Samuel C. Prescott, '94, and William L. Underwood, '98, said David A. A. Mossel, Head of the Laboratory of Bacteriology in the Central Institute for Nutrition and Food Research in Zeist, the Netherlands, in the 1968 Underwood-Prescott Lecture this fall.

Dr. Mossel spoke after receiving the Underwood-Prescott Award of the M.I.T. Department of Nutrition and Food Science; he paid tribute to the "beautiful experiments" of Dr. Prescott and Mr. Underwood on the bacteriology of foods and ways of rendering foods safe conducted in 1896 in the M.I.T. Department of Biology and Public Health. But despite modern knowledge of sterilization

At a press conference before the first of eight repertoire performances, the Living Theater's Julian Beck said its purpose "is to break the habitual, to give people some conception of another way of being." But when it came time for the anarchistic concepts of "Paradise Now," the Theater attracted so many unruly customers that its remaining performances were cancelled because of the "safety hazard" in Kresge Auditorium (Photo: Owen D. Franken, '68)



by both heat and radiation, the job is not yet done: there are new forms of conventional foods and new, unconventional foods to deal with, Dr. Mossel said, and there are still health episodes of which inadequate food sterilization is the cause.

In addition to his work in the Netherlands, Dr. Mossel is associated with the Institut Pasteur in Lille, France, and with the Department of Food Microbiology and Hygiene at San Marcos University in Lima, Peru. His award paid tribute to Dr. Mossel and indirectly, said Samuel A. Goldblith, '40, Professor of Food Science, to the "great and influential role of the Dutch in microbiology."

A Lively Living Theater

The controversial "new wave" Living Theater came to M.I.T. for eight performances in Kresge Auditorium in November at the invitation of the Department of Humanities—and left abruptly after six. Reviews of the performances ranged from enthusiastic to violently hostile; the

Department requested that the company depart only because the crowds they attracted could not be controlled in Kresge Auditorium.

When the Living Theater came to its most famous work, "Paradise Now," the success of their effort to create pandemonium and anarchy in the hall, including insults, obscenities, and near-nudism, finally led Jerome Y. Lettvin, '47, Professor of Communications Physiology, to urge the audience to "cool it and go home. There will be a bust!" he cried.

There was none, and the audience finally drifted off. But at one time there had been 500 people on the Kresge stage and many more in the aisles. Richard M. Douglas, Head of the Department of Humanities, and Warren A. Seamans, his assistant, told Mr. Beck that these crowds, "far in excess of legal limits, together with violation of fire regulations, created a major safety hazard. The design of the Auditorium and your dramatic format are such that control of the size of the audience becomes impossible," they said. The remaining two Living Theater performances were canceled when a more suitable theater could not be found.

First Woman Sloan Fellow

The first woman to be admitted to the Alfred P. Sloan Fellowship program in its 30-year history entered last summer. She is Sister Anne M. O'Neil, an educational administrator who is a member of the Society of the Sacred Heart, an order devoted to educational service.

Sister Anne has served for nine years as Headmistress of the Convent of the Sacred Heart School, Noroton, Conn., and is now Assistant Treasurer at Manhattanville College, Purchase, N.Y.

Sister Anne is studying the application of new management techniques and skills to nonprofit organizations. She is "an important example of the Sloan School's growing interest in the management of a wide variety of organizations," said Peter P. Gil, Associate Dean for Executive Programs at the Sloan School.

Lincoln Promotions

Four new assignments for members of the Lincoln Laboratory staff have been announced by Jack P. Ruina, M.I.T. Vice President for Special Laboratories.

C. Robert Wieser, '39, Deputy Director of the Laboratory, has been granted leave of absence to become Assistant Director of Defense Research and Engineering (Defensive Systems) in the Office of the Secretary of Defense. Gerald P. Dinneen has been advanced from Assistant to Associate Director of the Laboratory. Jerome Freedman, Head of Lincoln's Division 4 (Radar), has become Assistant Director with prime responsibility for strategic systems programs. And Walter E. Morrow, Jr., '49, Head of Division 6 (Communications), has

become Assistant Director for the communications and related programs.

Mr. Wieser came to M.I.T. in 1949 as a member of the Digital Computer Laboratory, where he supervised studies of the Whirlwind I computer applied to air traffic control. Since then he has been continuously involved in the application of computers to air defense and missile problems. Dr. Dinneen joined Lincoln in 1953 to work in the Data Processing Group; Mr. Freedman came to the Laboratory in 1952 for work on airborne and ground-based early warning radars; and Mr. Morrow joined Lincoln as a staff member in the Long Range Communications Group in 1951.

Coop and Community

An "activist" challenge rendered the 1968 Harvard Cooperative Society annual meeting into a convention of catcalls, booing, and points of order. For the first time in memory of the usually routine meetings, there was an opposition slate arrayed against the Board of Directors candidates nominated by the Coop's stockholders.

The insurgents, calling for a wider community role for the Coop, questioned the store's policies of job hiring, training, union relations, investment, and expansion; they wanted the store's assets used in ways which would better benefit the entire Cambridge community, they said.

The Society's bylaws stipulate that the stockholders' slate is automatically elected unless a quorum of at least 5 per cent of the active membership is present and voting at an annual meeting, and the 1,000 who turned out on October 23, 1968, were declared (to booing and hissing) to be 400 short. Admitting defeat, Wesley E. Profit, Harvard senior who organized the opposition, called on the stockholders' slate of new directors to "heed well why nearly 1,000 members came today. Just because we have lost the election," he said, "doesn't mean we will lose interest in the Coop."

Development Director

Nelson C. Lees, '53, formerly Assistant Director in the M.I.T. Development Office, has been named Director of Development; he succeeds Joseph J. Lambert, who has taken a similar position at Tufts University. As Director, Mr. Lees will be responsible for planning, reports and records relating to the Institute's development program.

Martin Lecture

Robert C. Seamans, Jr., Sc.D.'51, Hunsaker Professor of Aeronautics and Astronautics at M.I.T., has been chosen to deliver the 1969 Minta Martin Lecture at the Institute and at a number of other locations next spring, under sponsorship of M.I.T. and the American Institute of Aeronautics and Astronautics. His topic will be "Action and Reaction"; he will speak at M.I.T. on March 4.

The n Faces of M.I.T.

There used to be a few student "types" that everyone knew—the b.m.o.c., the "grind," the social beaver, the athlete. Now there are more—so many, in fact, that the types have become a spectrum from far left to far right, long hair to short, "midi" to "mini." And the familiar correlates of scientist, engineer, architect, or manager which used to help the "squares" put everyone in his place are no longer useful or appropriate. Everyone comes from everywhere—including, more often than not, Wellesley.

The accompanying pictures—all made during a three-week period in the fall—illustrate the point: from Student Center "sanctuary" to Junior Prom, from Gilbert and Sullivan to a co-ed winning the "ugly-man-on-campus" contest.

Field Day, the traditional freshman-sophomore athletic rivalry, was canceled this year when the sophomores boycotted it. The freshmen, noting that "the welcome increase in student concern for the world and community" has led "to a decrease in interest in frivolous activities," objected; the Freshman Council thought it still "would be good to have some place and time to let off steam."

What next?

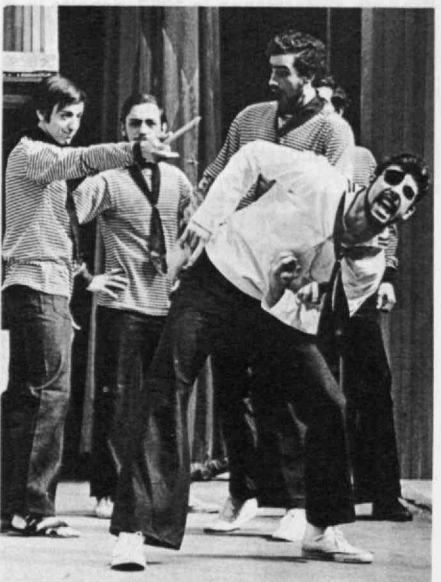
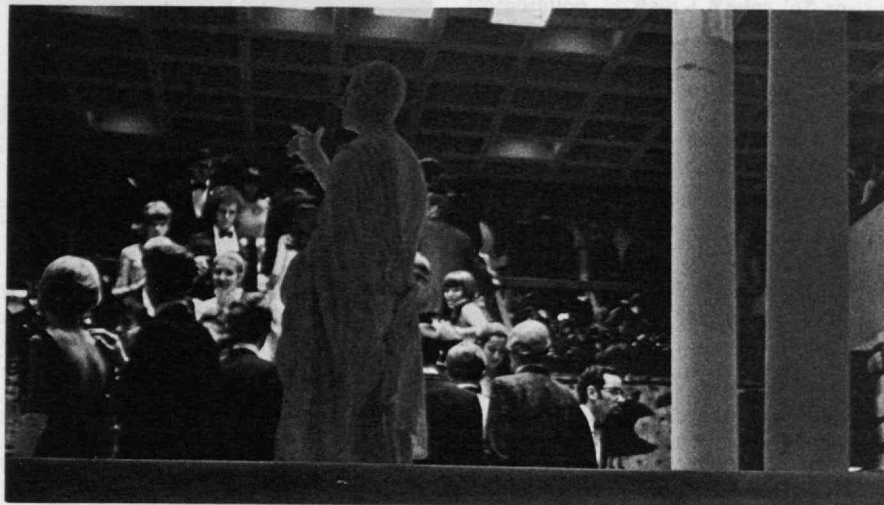


... No one was surprised when Cynthia Helgerson, '70, a surprise entry, won the "Ugliest Man on Campus" contest. At 1¢ a vote, she raised \$490 for the American Cancer Society vs. \$438 of her nearest rival.

... "See the big buildings all around, why not a place to wait for your bus?"—a proposal for Massachusetts Avenue by architecture students.

... A "sanctuary" in the M.I.T. Student Center (see Technology Review for Dec., p. 106) and—just one week later—the formal dance and informal "beer blast" of the J-P week-end (Photos: Owen D. Franken, '68)

... Stephen E. Barr, '70, as Dick Deadeye in the Gilbert and Sullivan Society's "H.M.S. Pinafore." (Photo: George J. Flynn, '69, from The Tech)



Though Ben Wilson, '70 (right), was the star, it took a team effort to bring M.I.T. its first I.C.4A. cross country championship this fall. The official team photograph shows Arthur E. Farnham, Jr., coach (left), James R. Yankaskas, '69 (co-captain), Larry D. Petro, '70, Horatio G. Daub, '70, Geoffrey G. Hallock, '69, John J. Wargo, Jr., '70, Ben Wilson, '70 (co-captain), Stanley M. Kozubek, '69, John C. Owens, '70, Eric H. Darling, '70, and Robert L. Justice, 3d, '71 (manager). (Photos: Jeffrey M. Reynolds, '69, and Jet Commercial Photographers)



Best in History

The M.I.T. cross country team completed its greatest weekend in the school's history of the sport at the end of the season last fall when the thinclads raced to M.I.T.'s first I.C.4A. college division championship at New York's van Cortlandt Park. Two days before at Wheaton College, the scene of the National College Division Cross Country Championships, M.I.T. ran fourth in a field of 54 schools.

The second-place finish in New York by Ben Wilson, '70, matched the best ever by a Tech runner, equaling Sumner Brown's performance in 1963, despite inclement weather on the 5.0-mile van Cortlandt Park course. But it was the vast improvement of Larry D. Petro, '70, who placed eleventh and was M.I.T.'s second man, which was the main factor in the two team successes.

Individuals Noteworthy

Vannevar Bush, '16 Honorary Chairman of the M.I.T. Corporation, given a Distinguished Service Citation by the National Science Teachers Association . . . **Frederick H. Norton, '18**, presented with the John Jeppson Award and Medal at the 70th annual meeting of the American Ceramic Society. . . **Albert G. H. Dietz, '32**, Professor of Building Engineering in the M.I.T. Department of Architecture, elected to Honorary Membership in the American Society for Testing and Materials . . .

Charles L. Miller, '51, Head of the M.I.T. Department of Civil Engineering, presented the George Westinghouse Award of the American Society for Engineering Education "for his perception of technological goals . . . we must reach and his contributions which have brought many of those goals within our grasp."



Miss R. M. Karapetoff Cobb, S.M.'23, the recipient of the 1968 T.A.P.P.I. Coating and Graphic Arts Division Award; she is the first woman to receive a division award . . . **James S. McDonnell, S.M.'25**, announces the formation of McDonnell Douglas Astronautics Company; **Walter F. Burke, '29**, is President, and **Ben G. Bromberg, Sc.D.'47**, is Vice President and General Manager of the Eastern Division . . .

Nathan Cohn, '27, Executive Vice President of Research and Corporate Development and a member of the Board of Directors of the Leeds and Northrup Company, this year's recipient of the I.E.E.E. Lamme Award . . . **John C. Leslie, '28**, Vice President, International Affairs, Pan American World Airways . . . **James Brown Fisk, '31**, President of Bell Telephone Laboratories, awarded the 45th Washington Award of the Western Society of Engineers . . . **Frederick A.**



More than 1,200 high school students from all over Greater Boston registered for "Saturday classes" taught by M.I.T. students and sponsored by the Technology Community Association in November. The students paid \$2 each to sign up for such courses as probability and information, neurophysiology, literature of the bizarre, African development, and more than 50 others.

Ritchie, '31, elected to the Board of Trustees of Franklin Pierce College, Rindge, N.H. . . . **Robert H. Winters, '33**, President of Brazilian Light and Power Company, Toronto, and a Director of the Canadian Imperial Bank of Commerce . . .

Donald K. Lister, '34, Vice President of Chemical Bank New York Trust Company, responsible for research and planning in the Personnel Division . . .

Richard F. Jarrell, '35, a Director of Fisher Scientific Company . . . **Melvin W. First, '36**, recipient of the Leslie Silverman Memorial Award at the annual meeting of the New England Chapter of the American Industrial Hygiene Association . . .

Arnold F. Kaulakis, '38, President and Chief Executive Officer of the recently formed Air Reduction/British Oxygen joint venture . . . **John C. Kinnear, '38**, Vice President of Operations for the Metal-Mining Division of Kennecott Copper Corporation, nominated for the post of President-Elect of the American Institute of Mining, Metallurgical, and Petroleum Engineers . . .

Eli M. Dannenberg, '39, Vice President of Cabot Corporation, Boston . . . **Harlow J. Reed, '39**, Executive Vice President and Chief Operating Officer at Olin Mathieson Chemical Corporation. . . .

Franklin W. Kolk, '41, Vice President—Development Engineering, of American Airlines . . . **James D. McNitt, S.M.'41**, Senior Vice President of Bristol-Myers Company . . . **George H. Vineyard, '41**, Chairman, Department of Physics, Brookhaven National Laboratory . . . **Robert L. Sinsheimer, '41**, Professor of Biophysics at the California Institute of Technology, Chairman of the Division of Biology there . . . **John F. Wilson, S.M.'41**, Vice President—Northeastern U.S. for Texas Instruments Inc.

Frederick Sargent, 2d, '42, member of a fifteen-man National Air Quality Criteria Advisory Committee to the National Center for Air Pollution Control . . . **Robert W. Van Tuyle, '42**, President and Chief Executive Officer of Slick Corporation . . .

Charles E. Burnham, '43, Director of Research and Engineering at the Draper Division of North American Rockwell Corporation . . . **Ward J. Haas, '43**, Vice President of Warner-Lambert Pharmaceutical Company and Director of the Warner-Lambert Research Institute . . . **Fred A. Mudgett, S.M.'43**, Group Vice President of The Hertz Corporation . . .

Robert E. Benedict, '44, President and Chief Executive Officer of Phelps Dodge International Corporation . . . **Robert E. Meyerhoff, '44**, President of the Board of Trustees of The Baltimore Museum of Art . . . **Caleb S. Taft, '44**, Vice President of the International Silver Company . . .

John J. McMullen, S.M.'45, President and Chairman of the Board of United States Lines Company and United States Lines, Inc. . . . **Robert N. Smith, S.M.'45**, President-Elect of the Ohio State Medical Association . . . **Kenneth N. Davis, '46**, Vice President and Treasurer of International Business Machines Corporation, elected President of Financial Executives Research Foundation . . .

Harl P. Aldrich, Jr., '47, Principal in the firm of Haley and Aldrich, Inc., consulting soil engineers and former member of the M.I.T. Civil Engineering faculty, elected President of the Boston Society of Civil Engineers . . . **Thomas L. Bell, Jr., '47**, Vice President and General Manager of the Lipe-Rollway Corporation . . . **Paul J. Kiefer, '47**, recipient of the American Institute of Aeronautics and Astronautics annual award for outstanding contributions to America's space program . . .

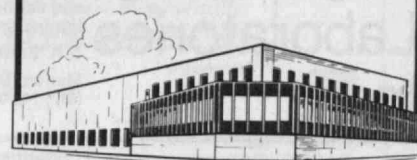
Joseph R. Myers, S.M.'47, Director of the Air Force Flight Dynamics Laboratory . . . **Benjamin L. Ranan, '47**, Vice President of Transiron Electric Corporation . . . **John E. Taft, '47**, Engineering Vice President for Honeywell's Computer Control Division . . .

William H. Revoir, '48, awarded the American Industrial Hygiene Association's Charles R. Williams Memorial Award for Outstanding Service to Industrial Hygiene . . . **S. James Adelstein, '48**, Associate Professor of Radiology and Director of the Division of Nuclear Medicine at the Peter Bent Brigham Hospital . . . **Wallace E. Howell, Sc.D.'48**, presented this year's Award for Outstanding Contribution to the Advance of Applied Meteorology . . . **Philip R. Marsilius, S.M.'48**, recipient of an honorary doctor of engineering degree from Norwich University . . .

Robert L. Hamman, '49, Professor of Economics and Head of the Economics Department at Drexel Institute of Technology . . . **Helmut E. Weber, '50**, Assistant Dean of the Graduate School and Professor of Mechanical Engineering at The Pennsylvania State University . . . **Robert B. Wolf, '50**, President of Itek Business Products . . .

Edward L. Bronstein, Jr., '51, President of The United States Bedding Company . . . **Richard R. Fidler, '51**, Director of Engineering for the Eastern Division of Sylvania Electronic Systems . . . **Murray Gell-Mann, Ph.D.'51**, given the John J. Carty Medal in recognition of his profound contributions to the development of elementary particle physics . . . **Robert C. Seamans, Jr., Sc.D.'51**, presented the 1967 I.E.E.E. Reliability Award for "exemplary reliability leadership and direction to N.A.S.A. and industry"; and elected Director of the State Street Bank and Trust Company, Boston . . .

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Ronald A. Kurtz, 1954

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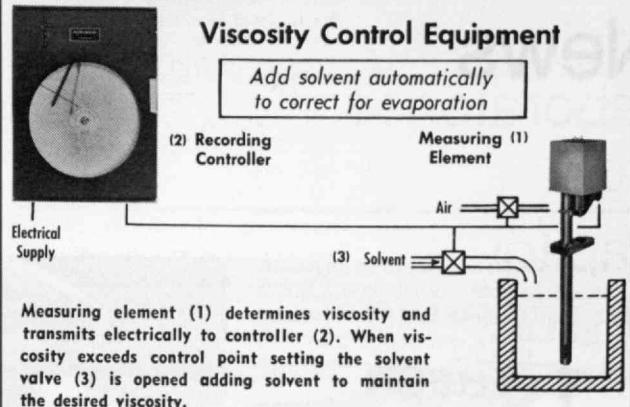
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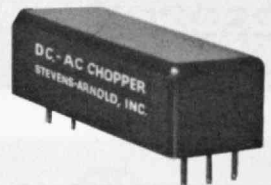
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Alumni News



U.S.S. John F. Kennedy: Alumni at the Helm

M.I.T. alumni hold key roles in running the U.S. Navy's newest aircraft carrier. Upon the commissioning in Newport News, Va., on September 7, 1968, of the aircraft carrier U.S.S. John F. Kennedy, Captain Earl Preston Yates, '51, became the first Commanding Officer of the ship and Commander Charles R. Smith, '57, became the ship's first Executive Officer.

The 88,000 ton carrier, built by Newport News Shipbuilding, is as high from keel to mast-top as a 23-story building, the flight deck is more than 1000 feet long and 250 feet wide, and the total power of the ship's electrical systems is more than 4 million watts. The Kennedy carries a normal complement of 5,000 men, about 80 jet aircraft, and four steam catapults capable of launching two to three planes a minute. Her top speed is classified. Thomas H. Moorer, Chief of Naval Operations, noted at the commissioning ceremony that the massive hull contains the products and techniques of every scientific discipline known to man.

Following graduation from the U.S. Naval Academy at Annapolis, Captain Yates' (below right) first assignment was on the destroyer U.S.S. Dyson, one of Admiral Arleigh Burke's (Ret.) famed "Little Beavers." After World War II, he returned to the Naval Academy for postgraduate studies and received an S.M. in aeronautical engineering at M.I.T. During this period, Captain Yates and two classmates became the first to construct and run a jet engine in the M.I.T. engine lab.

Commander Smith (far left), also a graduate of the Naval Academy, first served with the Aircraft Composite Squadron in New Jersey. He saw service aboard the U.S.S. Franklin D. Roosevelt in the Mediterranean and the U.S.A. Lake Champlain in Korea. Commander Smith returned to the naval postgraduate school for advanced engineering studies and completed his training at M.I.T. for the S.M., in naval architecture, specializing in weapons systems engineering. After a tour of duty at the Naval Air Station, Sanford, Fla., he attended the U.S. Naval War College and has subsequently served at the U.S. Naval Aviation Safety Center and as Operations Officer and then Commander of Heavy Attack Squadron Six. He





deployed to the U.S. Seventh Fleet, U.S.S. Constellation, for operations against North Vietnam and logged his 500th carrier landing while on this cruise.

To the left, Captain Earl P. Yates (right in picture), '51, and Rear Admiral Tazewell T. Shepard, Jr., Director, East Asian and Pacific Regions, Office of the Secretary of Defense, greet the former Jacqueline Kennedy, young John and Caroline. During the commissioning ceremony (below) the ship is turned over to Captain Yates by shipyard President, D. A. Holden. At lower left, Rear Admiral James C. Dempsey orders Captain Yates (left in picture) to "Place the John F. Kennedy in commission," while Mr. and Mrs. Ted Kennedy and Massachusetts Governor John Volpe (far right) look on.





Alumni Seminar: The Computer vs. the Real World

Even before you push the "panic" button on a computer system known as URBAN 5, the machine puts the instructions back on the screen in front of you. . . . because the system knows it is panicking even before the user does, explained Nicholas P. Negreponte, '66, Assistant Professor of Architecture, to members of the 1968 Alumni Seminar.

But Professor Negreponte did not answer the question with which Howard W. Johnson, President of M.I.T., opened the seminar: If we fail to determine and assign to the computer its proper role in human society, will we find we have created a helper who is "far from subservient?"

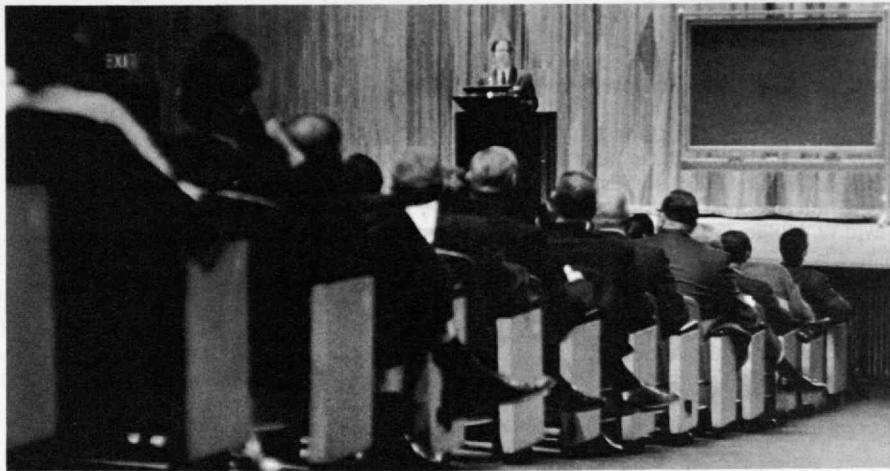
More than 300 alumni and wives returned to M.I.T. on November 9 to 11 for an intensive lecture and demonstration series to clarify the potential—and potential dangers—of the computer in modern society. Many of the arguments they heard will be summarized in the February issue of *Technology Review* and many of the papers will be printed in full in later issues of the *Review*. But none of these will replace the excitement of direct confrontation. For the issues which the computer raises for society are neither simple nor reasonable, and controversy enlivened many of the sessions.

For 40 members of the seminar—chosen by lot—the highlight of the three days was their chance to use equipment in M.I.T.'s new Information Processing Services Center to "play" the "university management game," a computer training program devised by International Business Machines Corporation. In groups of eight, they watched as the computer predicted the results of their manipulations of tuition rate, faculty salaries, faculty and instructors' salaries, public service commitments, plant investment, endowment funds, and financial policy. They saw how these results would effect the number of students and teachers they could attract and the quality of education and research they could achieve at "their university" in competition with four other "institutions"



trying to solve the same problems. The real question, its users discovered, was to determine the differences between the computer's model for university management and the real world as they understood it. Which view was in fact correct was for the "players" an academic question.

Advice to an Alumni Seminar team playing the "university management game" at M.I.T.'s new Information Processing Services Center: "Push the panic button and you get back the instructions again. The system knows the system is panicking even before the user does."



Alumni Seminar highlights—the traditional panel discussion, a series of Kresge Auditorium lectures (above: Joseph Weizenbaum, Professor of Electrical Engineering and of Political Science), and informal corridor and coffee-hour conversations (left, center) with Jay W. Forrester, S.M.'45, Professor of Management, and (right) with Robert A. Alberty, Dean of the School of Science.

Alumni Advisory Council: "Here's The Money and Up You Go!"

"Even if the resources of the U.S. were without limit—and they are not—and even if we could establish rational priorities, could we act in time to save America's cities?" asked John F. Collins, Visiting Professor of Urban Affairs at M.I.T., at the first meeting of the new Alumni Advisory Council this fall. And even if you answer "yes" today, he said, how about the 100 million more people who will be living in the U.S. in ten years?

There are parallels between the nation's situation today and that of twenty years ago: when in 1948 we needed a great continental air defense system, M.I.T. designed and American industry built SAGE. Today we need a great marshaling of technological and financial power to strike at the crisis in American cities; but can we do the job—and in time?

Saving American cities is an infinitely greater challenge than SAGE, or even than reaching the moon, for SAGE and the space program represented a direct application of technology to a technological problem: "Here's the money and up you go," said Professor Collins. The urban crisis represents a need for new technology applied to an almost infinitely complex set of social and technological problems; our approach must be entirely restructured.

One issue—a single aspect of the problem—concerns housing, the product of "one of the worst organized industries in America," said Professor Collins. Now, he said we foresee the possibility of applying computer technology to show how the industry's performance can be improved and to develop a strategy for the housing investment which must be made in U.S. cities in the next decade. This kind of problem said Professor Collins, "is an example of the kind of thing M.I.T. can and must do while it jealously guards the sword of individual academic freedom." Yet there is a dilemma here, too, he said: If we wait for M.I.T. to make its impact through the free choice of faculty and students, it may be too late to patch the "rending fabric of city life."

Alumni Association: Eliminating a Restriction

The Alumni Association Board of Directors will vote this spring on a change in the Association By-Laws to extend to all alumni the privilege of voting for term members of the Corporation. Article 1 (Section 4) of the By-Laws now reads that members of the Alumni Association "whose class was graduated at least five years previously" may vote for Corporation members proposed by the Nominating Committee. It is proposed to eliminate the five-year requirement "in keeping with the effort to give greater recognition to younger alumni and to students," according to Cecil H. Green, '23, President of the Alumni Association.

M.I.T. Club of Denver: "Articulate Voters" and the SST

"The supersonic transport should never fly at supersonic speed over the United States," Secor D. Browne, Associate Professor of Flight Transportation at M.I.T., told the *Denver Post* during a press conference in connection with an appearance before the M.I.T. Club of Denver on October 13.

"Any means of transportation, if used improperly, is unacceptable," he explained. And the supersonic transport, because of the shock waves it will produce, should never operate at supersonic speeds over the heads of an articulate voting population.

But there is still "an enormous amount of the world where the SST can operate very satisfactorily," said Professor Browne. Over-water routes are entirely feasible, so long as the aircraft attains supersonic speeds and decelerates from them over an ocean. This principle opens to SST service the busy routes to Europe from New York and to the Pacific from the U.S. West Coast. And the population across the Soviet Union from Moscow to Tokyo isn't an "articulate voting" one, he noted.

At subsonic speeds, said Professor Browne, the SST will produce less noise than current subsonic commercial planes. "The SST won't bother the citizens of Denver a bit more than present means of transportation," he declared.

Deceased

Benjamin F. Buckner, '95, August 17, 1952
Frederick W. Harris, '95, August 8, 1962
James M. Driscoll, '96, November 11*
Edgar M. Hawkins, '97
Pauline M. Atkins, '01, November 17
Calvin R. Sheafe, '04, August 15, 1968
Emil Steinberger, '05, August 17
Arthur M. Bellamy, '06, October 12
Harold B. Pickering, '08, March 25
Joseph G. Reid, '08, June 1
Merton Belcher, '09, January 5, 1968
Carl W. Dwight, '09, August 20

Harvey S. Benson, '12, November 6
Ralph T. Alger, '13, August 7*
Raymond C. Bergen, '13*
Charles W. Brown, '13, October 19*
Halsey B. Horner, '13, August 15
George Mactarnaghan, '13, September 13*
Dwight J. Stump, '14, October 17, 1965
Allen Abrams, '15, August 9*
Byron R. Cleveland, '18, November 5*
Raymond C. Baldes, '19, August 7
Marion S. Sanders, '20, April 17
Adolph F. Spiehler, '20, September 11
Ditlef J. F. Hald, '21, June 21
Maurice W. Williams, '22*
Livingston Wright, '22, November, 1965
Basil Ogden Stewart, '23, September 6*
Alexander J. Tigges, '23, September 3
Hervey S. Gardner, '25, January 17, 1968
Frank L. Hall, '25, November 14
Herbert T. Creedon, '26, October 30
Duryea E. Elmendorf, '26, October 12*
Frederick S. Erdman, '27, September 22
Sister Mary Edwina, '29, November 22, 1967
Robert R. Philippe, '29, June 29
Harry B. Ashenden, '33, October 20, 1967
Edward Targonski, '36, August 31
Grandville R. Jones, '37, July 19
David W. Mullin, '39, April 1968
James E. Jump, '41, June 10
Robert D. Gregg, Jr., '49, October 26, 1968
Alan R. Brodsky, '60, July 10
R. Gordon Cook, '62, August 17
Douglas De Lancy Wilson, '66, October 27

*For further information see Class Review

Technology Club: Dining in Midtown New York

Under the guiding hand of Anson Rosenthal, '27, the Technology Club held its irregular but somewhat annual cocktail party at the Chemists' Club on Tuesday, October 29. The guests of honor were H. W. "Bud" Fisher, '27, past General Chairman of the Alumni Center, and Angus MacDonald, '46, currently General Chairman. All officers of the Center were invited as Club guests and all members of the Center who had taken advantage of the Technology Club's dining privileges at the Chemists' Club were also invited.

The Technology Club, which is an off-spring of the old M.I.T. Club of New York, is really a "non-club"—dedicated to the principle that the fewer meetings the better. There are one or two meetings a year to plan a cocktail party. The Club's principal function is the maintenance of dining facilities for Tech alumni in the midtown area.

Alumni Calendar

Baltimore—February 6, Thursday, 6:30 p.m.—Dinner Meeting, Engineers Club.
Speaker: Hon. Robert C. Embry, Jr., Commissioner of Baltimore Housing and Community Development.

Boston—January 9, Thursday, 12:15 p.m.—Luncheon Meeting, Union Oyster

House. Speaker: Charles A. Myers, Professor of Management and Economics. "Current Trends and Labor Relations."

Denver—January 23, Thursday, 12:00 noon—Annual Luncheon Meeting, Athletic Club. Election of officers, reports and recognition awards.

Fairfield County—February 18, Tuesday, 6:15 p.m.—Dinner Meeting, Clambox (in Westport). Speaker: Charles E. Kendall, Vice President of Franklin National Bank. "Venture Capital Sources for Small Business."

Hartford—February 7, Friday—Joint dinner meeting, Wellesley and M.I.T. Clubs. Subject: The Cross Registration Program Between M.I.T. and Wellesley.

Long Island—March 15—Eastern Regional Alumni Conference. Sponsored by the M.I.T. Club of Long Island.

Los Angeles—Century Plaza Hotel January 7, Tuesday, 6 p.m.—Dinner, William F. Pounds, Dean of Sloan School will speak. New Opportunities in Management.

Mexico City—March 13-15—Mexico City Fiesta, M.I.T. Club of Mexico.

Newark—January 24, Friday—A visit to the Edison Laboratory and Museum in West Orange with Theodore M. Edison, '23, participating. Alumni, guests and children especially welcome.

Philadelphia—January 23, Thursday, 6:00 p.m.—Dinner Meeting, Union League. Speaker: Dr. Hans-Lukas Teuber. "Man and his Brain—New Disclosures on Perception, Memory and Action."

St. Louis—April 12, Saturday—Western Regional Alumni Conference. Sponsored by the M.I.T. Club of St. Louis.

Class Reunions—June 14-15, 1969.

Alumni Day—June 16, 1969.

Alumni who travel are invited to attend these Alumni Club programs.

Western Maine: New U.S. Destroyer Fleet Planned

Forty-five alumni and guests attended the fall dinner of the M.I.T. Club of Western Maine held on October 31, in Portland. Mr. William E. Haggett, Assistant to the President, Bath Iron Works Corporation, was guest speaker. His subject—the DX program at the Bath Iron Works, one of the finalists in a three-way competition for a two billion dollar contract to build destroyers for the U.S. Navy which would ultimately replace our aging World War II fleet. If the Maine firm is awarded the contract, or an essential part of it, the long-range impact on Maine's economy is expected to be substantial.

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~ In late October an AWOL soldier sought and received sanctuary in the Student Center. Now the ground has been broken, the definition of "a sacred and inviolable place" broadened. Who can tell where it will all end?



Students besiege President's office seeking sanctuary there for Cabbage Head, leader of newly organized activist group PHUI (Phalanx of Unwashed Iconoclasts)



Members of SBS (Students for a Better Sanctuary) present demands for sanctuary facilities: maid service; electric blankets; morning coffee; afternoon cocktails; 17 other items



Unhappy with SBS moderation, two splinter groups arise: SSBS (Students for Still Better Sanctuary Service),



and one which, while wrestling with the alphabet, demands academic credit for splintering

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Students Seeking Sanctuary in Corporation Meeting (SSSICM), insist on right to defend their interests, demand an end to discriminatory Closed Door Policy

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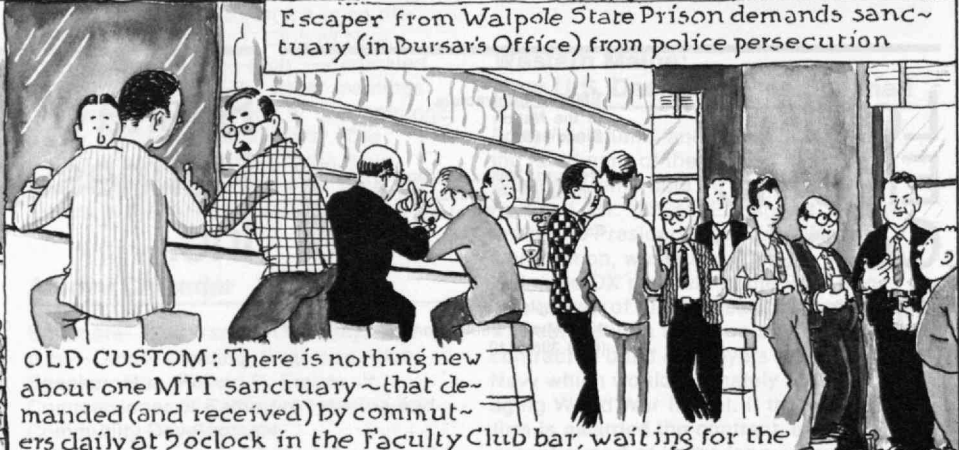


Escaper from Walpole State Prison demands sanctuary (in Bursar's Office) from police persecution

Searching for a spot of sanity, President Johnson seeks sanctuary....



in a local mental institution



OLD CUSTOM: There is nothing new about one MIT sanctuary ~ that demanded (and received) by commuters daily at 5 o'clock in the Faculty Club bar, waiting for the traffic to clear up. Some nights it takes a very long time

H-B-KANE

Class Review

Late News

Francis W. Sargent, '39, Lieutenant Governor of the Commonwealth of Massachusetts, will be the next Governor of the state when Governor John Volpe departs for Washington as Secretary of Transportation in the Nixon cabinet.

of Note

In the Far East	'97
Didn't fit as an engineer Willing to help worthy young man	'12
Amusing now	'15
Exciting architectural designs	'16
An unusual man and artist	'18
Like father like son	'20
Reception for Thai Princess Sharing a trip abroad	'21
"Egg Plant" forecasting technique	'24
The Lamme Award presented	'25
Elected president	'28
First communication since 1919	'29
Beer experts report	'33
Career	'41
Outrageous?	'49
Better luck next time	'54
A presidential candidate	'55
I.T.&T. success at 34	'57
They said it couldn't be done	Course VI
Society of Sloan Fellows	Course Review p. 134

Copy for this issue of *Technology Review* was due from your Secretary on November 10. Information reaching him after that date will be reported in the February issue unless he desires to insert it in the Late News column.

95

Another telephone talk with *Luther Conant* found him in good spirits. He enjoys his children both grand and great! The M.I.T. Honor Roll for 1969 reveals that there are 97 and 98 year old "boys", so we two "kids" send New Year's Wishes to one and all.—*Andrew D. Fuller*, Secretary, 1284 Beacon Street, Brookline, Mass. 02146

96

James M. Driscoll, Secretary of the Class, died at St. Elizabeth's Hospital on November 11, after a brief illness. He was 94. Born in Brookline on September 27, 1874, he was educated in their public schools and graduated from Course I in 1896. In 1908, he graduated from the YMCA Law School, now Northeastern, with an LLB degree. He worked for the Massachusetts Metropolitan Water Works on the survey of the Sudbury basin and the aqueduct from 1896 to 1900. From 1900 to 1902 he was with the U.S. Navy and the geodetic survey and spent over a year on the U.S.S. Vixen charting the Caribbean. He returned to Brookline to make a survey of the Holyhood Cemetery and stayed as its superintendent until his retirement in 1953. He married Alice Fay, of Grove Hall, in 1907. She and five children, Margaret, Nora and Martha D. Hogan, of Brookline, Clare, of Plymouth, Michael, '41, of Nantucket and seven grandchildren survive.

He had many interests. An active member of the Skating Club of Boston, he skated through April of this year. He was an honorary member of the Plymouth Yacht Club where he summered and enjoyed the companionship of his classmates, the Hedge twins. He enjoyed his associations on the Alumni Council and rarely missed their Monday evening meetings. He was a member of the Boston Society of Civil Engineers and the Catholic Alumni Sodality, and was also past President of the Massachusetts, New England and American Cemetery Associations as well as a Director and President of the Home for Catholic Children.



James Michael Driscoll, '96, (far left). Born September 27, 1874, died, November 11, 1968. Class Secretary and member of the Alumni Council. (© Fabian Bachrach)



Norman E. Seavey, '99, (left) in Honolulu. The lei, presented to him by the Rotary Club, was made of 300 carnation pinks.

Cardinal Cushing presided at his services which were conducted by his pastor and his cousin, the Reverend Robert Cloney, S.J., a professor of chemistry at Fordham. He was buried in St. Joseph Cemetery in West Roxbury which he had designed and built.

97

Since the last report from this source we have lost two members: *Frederic S. Atwood* and *Edgar M. Hawkins*.

In the Far East

From Orlando, Fla. comes a letter from Norman E. Seavey, '99, telling of his trip to the Far East.

"Dear George, Your letter of July 22, because of our absence and the difficulty of remailing, has reached me at last. I am most grateful to get it for two reasons. First, you are the only person who has taken the trouble to let me know that you saw it in the *Review*. Second, Because I have not seen any recent class news from you in the *Review*, I was worried, but now I know you are still with us and in your right mind. Praise be. Why did we take this long trip? At our ages, we find the summer temperatures in Florida are hard to take. So we find it necessary to get away.

"On June 12, it was easy to get aboard the Orsova of the P&O Line at Port Everglades. This ship carried us or should I say took care of us, until we landed August 19, at Vancouver, Canada. Because the ship had a doctor and a hospital, the risk did not seem too great. Where did we go? The ship's ports of call were: Nassau, Panama Canal, Acapulco, Los Angeles, San Francisco, Vancouver, Hawaii, Fiji, New Zealand, Australia, Hong Kong, Japan (4 days) and back to Hawaii and our debarking at Vancouver.

"What were the important things that we saw? at Acapulco, the celebrated diver who jumps from the 169 ft. cliff and dives into the ocean below (ocean depth being only 12 ft); at L.A. a trip to Disneyland; at S.F. a Chinese dinner followed by a night ride around the city, also a big crab dinner at Fisherman's

Wharf; at Vancouver, a trip through Stanley Park, a mountain ride around a new residential area which has a picturesque location, also a visit to the Queen Elizabeth Sunken Gardens; at Honolulu, a trip around the city and a delicious fruit salad lunch served in a big ripe pineapple at the Moana Hotel under a big banyan tree; at Sura Fiji the celebrated red coated military band which greeted us and played to us again at our departure; at New Zealand, the geyser, the hot springs and a visit to the Maori village; at Australia, a trip through the farming country on the way to the Blue Mountains, a day in Sydney with a visit to the zoo to see the strange animals—Koala bears, Emu-Kangaroo, platypus, Wallaby and Kookaburra. All native to this one country.

On to Hong Kong and Japan

"On leaving Australia, our ship sailed along the Great Barrier Reef and across the Coral Sea, on the way to Hong Kong. This sea is supposed to be very dangerous due to many cross currents. As a result, at its entrance, we took on a pilot who stayed with us, on constant duty for two and one half days. At Hong Kong—a trip through the New Territory to the border of Red China, a sail around the harbor with its junks and sampans, followed by a Chinese dinner at the harbor's Floating Restaurant. At our wharf when we docked, stood the Terminal Building. This is a modern big long structure. It has 150 modern ships. You buy at a fixed price with no bargaining. It also has several good restaurants. That evening on the upper floors of the Terminal Building, we went to a high class night club after an eight course Chinese dinner.

"At Japan, we landed at Kobe. Then visited Kyoto. It was from here that we took the celebrated "Bullet" train for a ride to Tokyo, 300 miles in 2¾ hours. Here in a city of eleven million population there was plenty to see and do.

"It was a long ship ride back to Honolulu. This visit again had something new. An evening at the Hilton Hawaiian Village Hotel. It was a luau (dinner) accompanied by one of the best night club entertainments I had ever seen. During the performance, those natives gave ex-

hibitions of the dance from each of the South Pacific Islands. Our debarkation was at Vancouver. From here we took the C.N. train for a four day and three night ride to Montreal across Canada. Every day the scenery was different. At Montreal we took two and one half days to rest up, then boarded a Greyhound bus to York Beach, Maine. Here we spent September, a beautiful month in an efficiency motel. Being only 18 miles from Dover, we had numerous callers.

"It was interesting to know that you have a son in the paper business following your footsteps. . . . For several months past I have missed your class news in the *Review*. This has been giving me some alarm, because you always had news when other classes had none. So you see your letter was a relief to my mind, especially so when you can recall the days of our youth on Summer Street. With the best of good wishes to both of you, Norman E. Seavey."—George R. Wadleigh, Acting Secretary, 70 Flower Avenue, Hastings-on-Hudson, N.Y. 10706

98

Best wishes for happiness during the year 1969 from your acting secretary.

The Honor Roll for 1968, which consisted of the fifty eldest living alumni as of October first, numbered three members of the Class of 1898. Listed according to their dates of birth, they are: *Alvan L. Davis*, May 11, 1875; *Walter Page*, June 16, 1875; *Mrs. Mabel Forrest Lambert*, December 25, 1875. Congratulations, and may your coming 94th year be a healthful one.

A lucky chap

Alvan, mentioned above, wrote that he was sorry he could not attend the Reunion in June: "I am very wobbly on my feet, and I have a heart condition that greatly limits energy output. So I live simply, taking only the measured exercise needed to maintain health. I can play bridge, chess, and labor over double crostics, and read detective yarns. By scrupulous attention to diet I avoid all internal discomfort, and lead a satis-



Robert J. King, '03, (left) with classmate and Class Secretary, John J. A. Nolan, '03, (right) at their reunion earlier this year.

fying life. In other words, I am a lucky chap at 93 years of age."

Do you remember *Joseph W. Ames* who attended M.I.T. with your Class? When I wrote to him in May to see if he would like to join you at the reunion, his daughter, Edith, answered that he would be unable to do so. He is at the good age of 92 years. They live in Melrose, Mass.

In Memoriam

Fred B. Dawes died August 21, 1968. Sympathy from the Class was sent to his daughter, Mrs. Julian Steele, who wrote as follows: "My father was in the Marlborough Hospital for a minor ailment and suffered an embolism. He had been in very good health, alert mentally, although rather feeble this year. He did attend the Alumni Day celebrations in June and enjoyed them so much." Information from the *Boston Globe* of August 23: Mr. Dawes was born in Hudson and graduated from Hudson High School in 1894 and from M.I.T. in 1898 (Course 6, Electrical Engineering). A World War I Army Captain, he was an electrical contractor for more than 60 years and for 53 years he was the moderator of the Hudson First Unitarian Church where Memorial services were held for him. He was past commander of the Hudson American Legion Post 100 and its chaplain for 15 years. An active member of the Hudson Historical Society, he was marshal for Hudson's Centennial Parade in 1966. Husband of the late Ada Taylor Dawes, he leaves his daughter, Mrs. Mary Steele of West Newbury; his son, Robert T. Dawes of Hudson (M.I.T. Class of 1926), President of the Hudson National Bank; three grandchildren and three great-grandchildren.—*Mrs. Audrey Jones Jones*, Acting Secretary, 232 Fountain Street, Springfield, Mass. 01108

07

The '07 Notes for the next few months will in all probability be very meager. After a long life of good health, old age has hit your Secretary P.B.W. in a very special spot, his eyesight. A recent trip to a specialist revealed that I have glaucoma in both eyes, as well as

cataracts. The glaucoma must first be reduced medically before an operation for cataracts can be performed. This prevents me from reading and writing for at least four to six months. With Mrs. Walker's help in reading to me the news about '07 as it comes in, and by dictating over the phone to my secretary, I will try to keep this '07 column alive even if it is short.

Volunteer needed

In October I visited with President *Don Robbins* at the Chaffee Nursing Home in Barrington, R.I., and found Don much improved. He hopes to be home before Thanksgiving, but it will be a long time before he can again preside at an '07 gathering. *Tom Gould*, our Assistant Secretary, is up and around but not physically able to carry on the secretarial work of the Class. If any '07 member would like to volunteer to carry on the Class notes, please write to me promptly.

In a note on an envelope sent to the Alumni Fund, *Frederick Dempwolf*, VI, noted, "My locomotion not good, eyesight poor, teeth false, otherwise in good shape."

Louis Freedman, II, wants all of '07 to know he has not retired. He is endeavoring to create an aircraft diesel power plant. He plans to use a diesel piston engine without a crank shaft having 97% mechanical efficiency, and developing 375 Horse Power when operating at 2000 revolutions per minute. . . . *Don Robbins* is now at home.

I have no obituary notices to start the New Year with, for which I am very thankful. The only '07 man who has written to me is *Kenneth Chipman*, who wished information about *Tom Gould*.—*Philip B. Walker*, Secretary and Treasurer, 18 Summit Street, Whitinsville, Mass. 01588—*Gardner S. Gould*, Assistant Secretary, 409 Highland Street, Newtonville, Mass. 02160

11

G. Arthur Brown of Alexandria, Va., sent me the following account of his life's work: "I have spent most of my life

in the chemical end of the tanning and shoe industry and in phases of the paper industry, during the war in Research and Development in the Office of the Quarter Master General, and later teaching leather technology. After graduation I worked nine years for the W. H. McElwain Company in Manchester, N.H., in chemical work connected with their shoe factories and tanneries. Following this I was with Calco Chemical in Bound Brook, N.J., in application of dyes for tanneries and textiles. Next I went to Canada for a number of years with Bennett Ltd., manufacturers of leather board, shoe counters, paper board and products for shoe factories.

The outcome of this work was the establishment in the U.S. of Bennett, Inc., for the manufacture of dispersions and equipment for the paper industry and for which I obtained patents. This was followed by work in Newark, N.J., with a company manufacturing chemical supplies and finishes for the tanning industry. The depression changed my plans at this point. Following a period with Hamel Leather Company, tanners of goat and sheep skin lining leathers, I spent a good many years with Endicott-Johnson Corporation, Endicott, N.Y., in their chemical division related to development and manufacture of supplies for their tanneries and shoe factories and in control problems of the tanneries. In 1941 I came to Washington to the Office of the Quarter Master General as leather technologist dealing with specifications and research and development for leather for the army.

I served on the Federal Specifications Board for leather specifications for the army and as army representative and as an alternate on the A.N.M. Board Leather Division. After the war was over I taught at Pratt Institute, Brooklyn, N.Y., in the newly established School of Leather Engineering which was supported by the tanning and allied industries. I also taught at Lowell Technological Institute at Lowell, Mass., in their Leather Engineering School until I retired to my home in Arlington, Va. In 1966 I sold the Arlington place and I took a garden apartment in Parkfairfax, Alexandria, Va. We had been here only a short time when my wife, Hazel, fell and broke her hip.

After coming home from the hospital and apparently recovering from the operation she suddenly collapsed and passed away. In 1967, I had a heart attack and I am now here alone in the apartment keeping busy with reading, correspondence and doing some painting for a hobby. We had four sons all of whom served in the war. My oldest son, Hammond, was with IBM until his death in 1963; Marshall has a photographic studio in Endicott, N.Y.; Gordon is at the Army Map Service in Washington, D.C.; Russell is with Western Electric Company in New York City."

Enjoying retirement

A nice long letter from *Oliver D. Powell* of Glendale, Calif., contained the following: "Time passes quickly and it doesn't seem possible that it was seven years ago when I was at the 50th reunion of the Class of '11 or that four years later I was again in Boston to attend an Alumni Day. That was the year that Dorothy and I drove 15,000 miles around the United States and Canada. Since then life has gone along quite evenly. I have enjoyed my retirement and we travel a bit. In 1966 we took the very enjoyable inner passage cruise from Vancouver to Skagway on the Princess Pat of the Canadian Pacific. If we do it again we will see more of Alaska. In 1967 we went to Jackson Lodge in the Grand Tetons, via Las Vegas, Yellowstone and down the coast.

"So far this year we have done little other than some trips to Palm Springs and Palm Desert. However, we expect to spend Thanksgiving with our son's family in San Rafael, over the Golden Gate Bridge from San Francisco. Oh yes, we flew to Willets, 135 miles north of San Francisco about six weeks ago to see something of the Brooktrails Redwood Park, a beautiful real estate development among the redwoods. In mid December we fly to Philadelphia to spend the holidays with our daughter and her family in Doylestown, Pa. In mid January we go to Florida for a week and then a six-day cruise in the Caribbean. During the year I have had operations for cataracts on both eyes, but with plastic lenses (rather than contacts) I seem to be doing quite well. Anyway I passed the driving test that the State requires and manage to get around to places too far to walk to." (The above letter was dated October 28.)

Changes of address

Minot S. Dennet, Villa Capri, 1205 Mariposa Avenue, Coral Gables, Fla. 32146; *Edward Kenway*, 119 Pantry Road, Sudbury, Mass. 01776.

Around and about

From *John F. Alter* I learned of the death of his wife, Margaret, who died of a shock last July. . . . *Morris Omansky* had a long talk with Sarah Lowenberg. She has completely recovered from her recent illness and said that *Maurice* is up and around and well on the way to recovery from his sickness. . . . From *Mrs. Jean Zapple* I have a little more

information about her father, *Alexander Yereance*. Aleck, who was a major, retired at the time of his death, served with the 80th division, 305th Engineers during World War I and in World War II in the Boston area and in the Pentagon. He was a member of the American Society of Civil Engineers, the M.I.T. Club of Washington, the Retired Officers Club of Washington and had organized the American Legion Post in South Orange, N.J. . . . *Frank Smith*, of Honolulu, along with a nice letter, sent me several photographs of some boat models that he had made and boats he had sailed. He has always been interested in pleasure sailing and was personally acquainted with Nat Herreshoff, the great yacht designer. In his younger days he built a six-foot model sloop which he sailed and raced on the Storrow Lagoon off the Charles River.—*Oberlin S. Clark*, Secretary, 50 Leonard Road, North Weymouth, Mass. 02191

12

DO YOU REMEMBER Dr. Henry P. Talbot who was in charge of Courses V and X? Here is a photo which was loaned me by *Hugo Hanson* showing him with all but one of the 36 members of our Class in chemical engineering. The missing member is *Louis Walsh*. With some assistance from the *Senior Portfolio* we have identified the men as follows: (bottom row from left to right) *Murray, Hanson, Reiman, Gabriel, Suzuki, Reeves, White*; (second row) *Hsueh, Fredriksen, Hyde, Professor Talbot, Pedersen, Pratt, Lawrence*; (third row) *Lang, O'Brien, Reiser, Goodnow, Kahn, Robinson, Levermore, Merrill, Tirrell, Albee*; (top row) *Ross, Comstock, Howell, Sanburn, Mitchell, Marceau, MacDonald, Wolfe, Drewsen, Torrey, Manning, Barker*. Of these, 15 are still living (*Murray, Hanson, Reeves, Hyde, Pratt, Lawrence, Lang, Kahn, Merrill, Comstock, Mitchell, MacDonald, Drewsen, Torrey, and Manning*), an excellent longevity record. Incidentally, we have heard from all but two of these men within the past year. Let's make it unanimous! If any classmates of other courses have saved such group photos we shall appreciate the opportunity of reproducing them in this column.

We regret to advise of the passing on August 11, 1968 of *John Crowley* of Reading, Mass. No details are available.

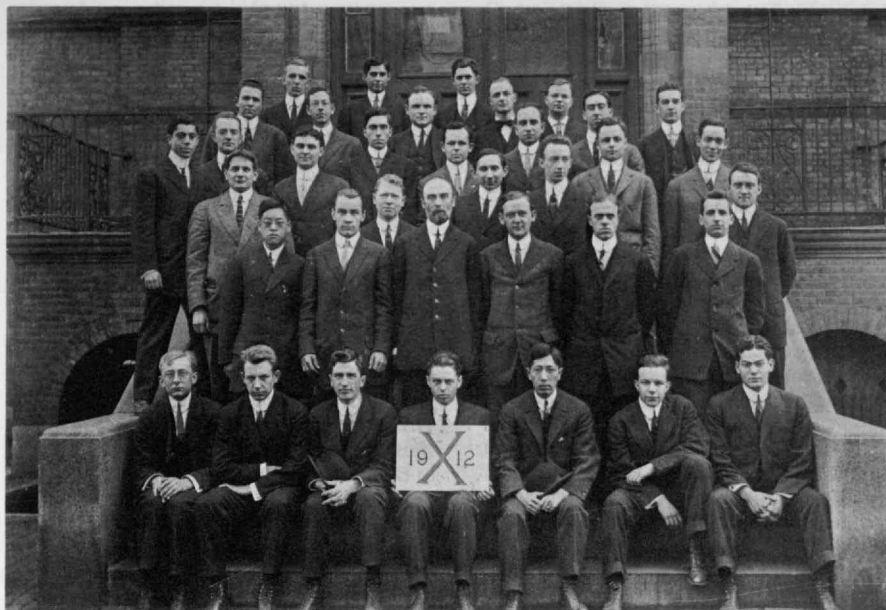
News from home and phone

I am pleased to tell you that on September 18th, Helen and I celebrated our 50th anniversary, a golden event which several of you have already happily observed. Our two daughters, from Pennsylvania and Missouri, were hostesses at the reception. . . . The three following items from classmates were obtained through Jim Cook who talked with them by telephone. *Milton Kahn* is still active in his business, the Kahn Paper Company, Boston, and has no intention of retiring in the near future. He has two sons who are doing well in other lines

of work. His hobby is golf and he still plays frequently. Over the years he has been active as a leader in civic and religious affairs and is presently chairman of the Combined Jewish Philanthropies covering not only Boston, but the nation. . . . *Edmund Homan* served in World War I, after which he took an apprentice course with General Electric at Lynn, Mass. He then entered the Engineering Department of the Small Turbine Division, Lynn, where he spent most of his career, although the last of the period was in the same Division in Fitchburg, Mass. He retired in 1954 and both he and his wife are in reasonably good health. They have no children. He does not drive and does not travel except locally. . . . *Charlie Webber* owns a house in Acton, Mass., where he has lived with his grandson since the death of his wife in 1965. They had no children but adopted three. There are five grandchildren and one great grandson. After many years with the Lumberman's Mutual Casualty Company in the Engineering Department, he retired in 1953, but continued to work part time for several years when he was offered a job with the New England Insurance Services, with whom he is still employed. He drives an average of 100 miles a day on business. His hobby is shop work and he has a place in his cellar for this purpose.

Didn't fit as an engineer

I was also surprised and pleased to receive a four page letter from *Joseph Boyer* of Gloucester who spent but one year with us in Course II. Before the end of the first semester he found that he did not fit as an engineer but stayed until June and passed. He then decided he should try law and graduated from the Boston University law school in 1912. He was admitted to the bar in Massachusetts and Florida the same year. He became a member of the firm of Butler and Boyer, Jacksonville, in 1914, where he continued until 1923 with two years out for Army service in W.W.I, being discharged as 1st Lieutenant of Infantry. Most of this period was spent in legal work. He married a Mt. Holyoke 1913 graduate in 1923 and moved to Gloucester where he has lived ever since practicing law in Boston until his retirement, which only now is fully complete. The Boyers have two children and seven grandchildren. We quote, "Suffice it to say I found my second guess in law much nearer the mark than engineering. I found my slot. My professional life, as well as the rest, has been interesting, satisfying and rewarding. My civic activity has been focused on the Gloucester Public Library in which I served for 40 years, acting as Chairman from 1938 until this year. The library was at first an endowed charitable corporation and has for 30 years received steadily increasing appropriations from the city, which now bears most of the cost. I admit that my participation in this project has given me a great deal of satisfaction. In closing, I know I would never have been a success as an engineer, but nevertheless, I have always considered M.I.T. my Alma Mater, and



All but one of the 36 members of the Class of 1912 in chemical engineering with Professor Henry P. Talbot. Bottom row from left to right: Murray, Hanson, Reiman, Gabriel, Suzuki, Reeves, White; Second row: Hsueh, Fredriksen, Hyde, Professor Talbot, Pedersen, Pratt, Lawrence; Third row: Lang, O'Brien, Reiser, Goodnow, Kahn, Robinson, Levermore, Merrill, Tirrell, Albee; Top row: Ross, Comstock, Howell, Sanburn, Mitchell, Marceau, MacDonough, Wolfe, Drewsen, Torrey, Manning, and Barker.

welcome this opportunity to go on record." We shall be glad, Joe, to welcome you at our next reunion.

Willing to help worthy young man

Harold Danser is, so far as we know, our only classmate who has made stock market investment his principal vocation. He writes, "After graduation I followed engineering until 1926 and then decided to enter Wall Street and the stock market. I was quite successful until the panic of 1929, when after making a small fortune, saw it all wiped out. Since that time I have recovered and now, at the age of 80, have become most successful, with no debts and more income than I can spend. I have two sons—Harold, Jr., and Douglas—who live in Holyoke, Mass., and Naples, Fla. both have been quite successful. Also, I have four interesting grandchildren. I have had many years of contact with my work at Tech and would be glad to help any worthy young man get started at the Institute."

Letter box

Pierre Drewsen sent a brief note with the unfortunate news that he had developed cancer of the throat, and with his vocal chords removed must now "talk" with the aid of an electronic instrument. He had quit smoking many years ago and accordingly believes the trouble was due in most part to being in smoke-filled rooms for sustained periods during his service as mayor of Northampton, Mass., during 1953 and 1954. Pierre says, "Otherwise, everything is 'jake' with me. We are very happy in our second marriage. We had three summer homes on Cape Cod where we spent considerable time, but sold the last one this year as my wife, Dorothy, had suffered a heart attack. I plan to permanently retire this year and hope we shall be able to spend the winter in the south, maybe Mexico or Florida." Our sincere wishes for improved health for you both in the future!

Joe Champagne writes he is in good health, though he is getting lazy. Al-

though he claims to have "practically retired", he started his seventeenth season this fall at the Naval War College in Newport where he and Libby have their dancing classes. They also are holding dancing classes at the South Weymouth Naval Air Station. They have a summer home in Tiverton, R.I., and for the past two years have spent the winter months in Puerto Rico. During the past 20 years they have travelled a great deal—twice around the world and an annual trip to Europe or the Middle East.

Bill Bird wrote us from Springfield, Mass., where he had been visiting, though his permanent home is still at the Dorchester in Delray Beach, Fla. He and his wife continue to be in good health. As a "man of leisure", he greatly enjoys fishing, hunting and golf. He can be found on the course two or three days each week.

Paul Tyler has moved from Washington, D.C., where he spent many years, to a new home in Holmes Beach, Florida on Anna Maria Island. He and Katherine are finding it difficult to adjust to the entirely different type of life, where everyone plays bridge and golf most of the time, pastimes which they do not particularly enjoy. There is also fishing, Paul. We hope that as you get more acquainted you will find that you like Florida better, though we have found that a few months in the cold weather are enough to satisfy us.

Jay Pratt planned to visit Ralph Hyde and Ruth this summer while in New England but was unable to make it. He learned that they still live in Taunton and are in reasonably good health. We hope to receive a letter from him shortly.

Julius Rosenberg writes briefly, "I enjoy reading of the doings of the boys I have not seen for a long, long time. Am retired and living in Miami, enjoying a quiet and happy life. I am serving as a

trustee at Cedars of Lebanon and Mt. Sinai Hospitals and am a Benefactor of the Opera Guild of Greater Miami. I am also the quiet half of a couple with a very social minded partner who is engaged in everything."

A note from *Bill Reeves* states that he and Bea are in good health and were leaving on an auto trip to Minneapolis to visit son Tom and family. They expected to be home in time to vote in November. They are still living in the same home in Palmerton, Pa., but the address has been changed to #1027 Circle Drive by the local post office.

One hundred are silent

We thank all of you whose contributions have made the 1912 News columns possible. There are, however, still over one hundred on the Class roster from whom we have heard nothing. Won't you take the time to write a note and let us know you are still about and what you are doing? And to those who have already sent in a "history" please surprise us by writing what has been going on the past year. Your classmates will be interested. As John Foley recently admonished, "It's later than you think!"—*Ray E. Wilson*, Secretary, 304 Park Avenue, Swarthmore, Pa. 19081; *Jay H. Pratt*, Assistant Secretary, 937 Fair Oaks Avenues, Oak Park, Ill. 60302

13

Happy New Year to all 1913 classmates of M.I.T.

It is with a very heavy heart, but our duty, that we report the sad news as well as the cheerful. Many thanks to Herbert Shaw for writing us that our loyal classmate, *Charles W. Brown*, passed away October 19, 1968, in Eugene, Oregon. Charles was one of the greatest helpers at many of our reunions, entertaining at the piano or with his accordian. Following the Browns moving to New Mexico, Charlie wrote frequently concerning

their travels in or to the West Coast. He spent most of his time and energy making his dear wife comfortable up to the end of her life. In early September he wrote through the Alumni Fund that he intended to leave for California and Oregon to visit his two sons. Always so cheerful. Charlie died suddenly while visiting his son, Richard T. Brown, 3590 Knob Hill Lane, Eugene, Oregon 97405. His other son, William E. Brown, 12771 Melody Drive, Garden Grove, Calif. 92641, survives him as well as five grandchildren.

Several of our letters which were sent out in early November were returned merely stamped or marked "deceased." The addresses were: *Raymond C. Bergen*, 36 South Clinton Avenue, Bay Shore, N.Y. 11706; *George Mactarnaghan*, 604 Mt. View, Bluefield, West Va. 24701 (the envelope marked "deceased 9/13/68"). A letter to Murtha P. Quinn, Apartment 203, 6673 Emlen Street, Philadelphia, Pa., 19119, was returned marked "Unknown." If anyone of our classmates has any information regarding these classmates mentioned above, kindly notify us.

A note has been received from Mrs. *Ralph T. Alger*, 217 S.E. 18th Street, Deerfield Beach, Fla. 33441, and we quote: "I'm sorry to have to tell you that Mr. Alger passed away August 7th (1968). He was a wonderful man. Everybody liked him, we all miss him very much. Sincerely, Mary L. Alger." All members of the Class of 1913 offer our sincere sympathy to you Mrs. Alger.

Your Treasurer sent out nearly 180 bills for yearly dues. Thank you very much to all who have remitted. We have received over 70 replies to date. . . . The *Lee Bowmans* have left Quincy, Mass., and are now living at 626 Warren Street Albany, N.Y. 12209. *James M. Beale* has changed his residence to 436 Virginia Avenue, Venice, Fla. 33695. Several of our regular correspondents have voted for a 60th Reunion in 1973. In the February issue of *Technology Review* your Scribe will insert further comments in detail.—*George Philip Capen*, Secretary, 60 Everett Street, Canton, Mass. 02021

14

Our reunion chairmen, *Leicester Hamilton* and *Harold Wilkins*, aided by comments from class members, have been at it diligently and we have a summary of the reunion plans as they now stand. You will all be given details shortly, but we can give you a little peep at the more important facts. The dates are Friday, June 13, Saturday, June 14, Sunday, June 15 and Monday, June 16. Activities are generally expected to be on campus. Housing, on campus, will be in the women's dormitory, a very attractive location on Memorial Drive facing the Charles River—ample free parking, etc. The classes of 1909 (60 years), 1914 (55 years) and 1919 (50 years) will occupy McCormick Hall. A cocktail

party at McCormick, outdoors if weather permits, will start things, followed by a buffet supper in the dining hall. Later activities include religious services on Sunday, official class banquet and there may be entertainment in Kresge (indefinite). Trips for ladies include a visit to the top of the Prudential Building, a location which boasts excellent shopping facilities. General note: The 1914 fund will probably take care of all except personal expenses.

Excels in vital matters

Ham's proximity and association with the Institute have undoubtedly been a powerful factor in our successfully obtaining accommodations on campus, and while we are patting him on the back it should also be noted that he excels for our class in other vital matters. We have had occasion recently to publicize the fact that *Alden Waitt* had just become a great grandfather for the first time. Let it be recorded that *Les* and *Alma Hamilton* have two children, nine grandchildren and three great grandchildren, with two more (twins) on the way.—*Herman A. Atfel*, Secretary, Rome, Maine. Post Office address: RFD 2, Oakland, Maine 04963

15

Happy New Year with the hope that you and your families have all enjoyed a pleasant and comfortable holiday season.

The Class Supreme

The Class proved itself again by the attendance of 27 classmates and guests at our class dinner, October 18, at the M.I.T. Faculty Club, Cambridge. Present were: *Barry Bailey*, South Duxbury; *Sam Berke*, Lakeville, Conn.; *Wayne Bradley*, Moosup, Conn.; *Whit Brown*, Concord; *Evers Burtner*; *Jack Dalton* and *Pop Wood*, Peterboro, N.H.; *Ray Delano*, Duxbury; *Larry Landers*; *Azel Mack*; *Hank Marion*, Plainfield, N.J.; *Archie Morrison* and *Fred Waters*, Swampscott; *Ben Neal*, Lockport, N.Y.; *Frank Murphy*; *Charlie Norton*, Martha's Vineyard; *Stan Osborn*, Hartford, Conn.; *Wally Pike*; *Pirate* and *Gerry Rooney*; *Jac Sindler*; *Bill Smith*; *Max Woythaler*, Framingham; *Jim Hoey*, President '43; *Bill Sheils*, his son, Paul, and his brother Jack.

From this list you can see that the long distance men practically outnumbered us local fellows, with the honors going to *Sam Berke*, *Ben Neal*, *Wayne Bradley*, *Stan Osborn*, *Hank Marion* and *Charlie Norton*. It was a pleasure to have our younger members with us again. We were most happy to see Henry's grandson, young Paul Sheils. These boys are always welcome and we hope they will always be with us. The Eisenberg brothers and David Hamburg had to make late cancellations. *Hank Marion*, flew up just for the dinner, returning early Saturday morning. The lively, enthusiastic and enjoyable meeting opened with the old Pirate leading a stimulating "We are Happy" cheer. Cocktails and

an excellent Bill Morrison dinner put us in a pleasant and nostalgic mood. This splendid attendance and the interest and loyalty of those men who came such great distances just to be with their classmates is a glorious example of our fine, outstanding class spirit and friendships. Surely a fine group—long may we stay together.

At our dinner we all signed a "get well" card for *Clive Lacy*, who continues to have a slow and discouraging recovery from his cataract operation. Good cheer, *Clive*. *Charlie Norton* and *Ben Neal* stayed over with us—welcome guest. While here, *Hank* visited *Ruthie (Place) Hickey* and her husband who had been in Boston over a month visiting their many old friends. They all had attended Woburn High School together many years ago. At our dinner *Sam Berke* made a few non-technical remarks about the artificial insemination process used on his Golden Guernsey cows. *Jack Dalton* closed the dinner with some appropriate and touching remarks about our splendid class spirit and a hearty welcome to the younger members. After the dinner *Wayne Bradley* and *Hank Marion* came over to our apartment to visit with Fran—a delightful close for the evening.

The annual trek of the "snow birds" to Florida has begun. Leaving in November were *Whit Brown*, *Harvey Daniels*, *Larry Landers*, *Boots Malone*, *Doug McMurtrie* and *Jim Tobey* and others, no doubt. Ah, me!

Phil Alger has seen *Sampson Mar* (Pellian Mar's grandson) at Rensselaer in Troy, N.Y., where he is studying aeronautical engineering. There's that friendly Class Supreme spirit again. *Phil* was a little shocked that his picture in October class notes has shown his advancing years. *Phil* recently presented a very learned and idealistic paper on "Ethics and The American Society for Quality Control." *Larry Bailey*, always a staunch classmate, found time from serious family illness at home to be at the October 18 class dinner. We were all glad to have *Larry* with us.

Classmate deceased

It is sad to report that *Allen Abrams* died August 9. A graduate of Washington and Jefferson College (A.B. 1910; M.S. 1915; D.Sc. 1937) where he later became a trustee, he joined us in Course V. After spending 1917-1919 in the Chemical Warfare Service, he held several important technical positions in the paper industry—Director of the Cornell Wood Products Company and the Marathon Corporation as well as the Wausau Paper Mills. He held patents on pulp, paper and converted products, did outstanding chemical research in the pulp and paper industry, and published papers in this field. After retirement he became a consultant for Arthur D. Little, Inc. He was always active and interested in '15 and M.I.T. affairs. The sympathy of the Class goes to his family.

Amusing now

From Pasadena, *Frank Boynton* writes about an experience he had at Tech. I'm sure many of us must have had similar troubles. I can recall several bad explosions in our Course X chemical laboratories. But, we were young and fearless, then. "I have thought of you and your years of dedication to the Class Supreme so many times and wondered what I could write to aid you with your class notes. My wife and I are both pretty well and that alone is a very great blessing. We lead a very quiet life. We are still interested in birds and I arise about daylight or just before, each morning to put out feed. I have thought of one rather amusing (now) incident which some of our classmates in Course VI may remember. It happened in the winter of 1914, I think, and occurred in the electrical lab. We were performing some rather complicated (to me) experiment and I had completed all the wiring preliminary to plugging in the power. At this point, I regret to confess, that as my last plug went into the power panel on our laboratory table the main circuit breakers on the entire lab blew out and everything came to a halt. I had inadvertently put a direct short on the power. The professor and his assistants came running out of their offices and got things going again. Strange as it may seem they made no effort to pin point the culprit. For that I was duly thankful as it was I. Probably they had had the same thing happen before. I hope some of my Course VI classmates may remember it and get a smile."

Suffer in West Palm Beach

In answer to that wartime postal *Jim Tobey* sent me and which I recently returned to him, Jim wrote: "I appreciate your letter of the 25th, with the quarter-century-old postcard from me in gay Paree to you in dear old Boston. As you see, I can use the typewriter, although perhaps not quite as fluently as of yore. I received my cataract lenses somewhat over two weeks ago, and am getting fairly well adjusted to them. Have started driving the car, at least down to the P.O. and supermarket, only a mile or so away. I am sorry to hear about Clive Lacy's eye troubles. As I recall it, Anderson, in Philadelphia, also had some serious difficulty. On September 8th Lena and I celebrated our 50th wedding anniversary. Our son and spouse and four of his five children, daughter and better half and three of her brood of four were here, along with some 30 friends and neighbors. We received quite a bit of loot, some of it liquid. We plan to shove off for Florida at end of November and are, in fact, signed up there. Sorry not to have seen you this fall, but shall look forward to a visit in spring. Or, come on down and suffer in West Palm." We're all glad Jim has had a successful recovery from his cataract surgery, so he can suffer through another winter at West Palm. Ah, me!

Annual dinner

Larry Landers is setting up our annual New York City class dinner at The

Chemists' Club there, for some time in April. Have you noticed that the column is running low on class news and notes? Help, help!—*Azel W. Mack*, Class Secretary, 100 Memorial Drive, Cambridge, Mass. 02142

16

We start with a thought that *Irv McDaniel* sent us when he and Kay were off in the middle of the Pacific and were thinking about fundamentals: "Postage rates are strange and fickle, a penny postal costs a nickel!" And with elections about here, as we write, Irv has been more than busy doing his best to see that the right information gets around, and that friends, relatives and countrymen do the right thing in the voting booths.

Secondly, we are very sorry to report an item that resulted from inadequate checking of the numbers in our column for the October-November issue. We reported that there were 37 at the 52nd Reunion in June, yet the count of names was only 35. Missing were the names of *Theron Curtis* and *Hope Curtis*, but they surely were there. And error No. 2 of that issue was the editorial addition of "'39" after the *Theron Curtis*' name later in the column. The interesting fact is that there really is a *Theron Curtis*, '39, *Theron Curtis, Jr.*, actually one of our 1916 Class Babies way back in the days of the Tech on Boylston Street.

Exciting architectural designs

In the last issue we mentioned two published articles about "new and revolutionary" architectural designs and buildings that are the result of work by *Izzy Richmond* and his associate. We then covered the first item on a new circular-building design for the elderly. This time we refer to the second article relating to "Boston's Revolutionary New Schools" reported in the June 2 *Sunday Herald Traveler*—three elementary schools in the Roxbury-Dorchester areas. "The architectural designs were recently completed—the Franklin Field School by the Boston firm of *Isidore Richmond* and *Carney Goldberg*. These schools follow a new concept of multiple facilities as well as community orientation. They will operate as 'clusters.' Each will have its own and complete set of facilities (indeed, they will be the best equipped elementary schools in Boston); yet each will also have a specialty. One will emphasize athletic facilities and swimming, one science, and the third has special installations for the dramatic arts."

Izzy's Franklin Field School "will emphasize the theatre arts, speech, and music. While its site is only five acres, it adjoins Franklin Field, and arrangements have been made by the architect that outdoor school activities can expand into the Franklin Field area, which is controlled by the Parks Department." In *Izzy's* words, at a meeting when the plans were unveiled: "I have never had a more complete program to work with. This school offers everything—nothing

has been left out; it represents a whole new concept of education, a new way for children to learn." Exciting? Just talk to *Izzy* about it, as we did at the reunion!



Artists' model of the Joseph Lee School, Franklin Field, Dorchester District—Boston, designed by *Isidore Richmond*, '16, and *Carney Goldberg*, '28. View of the main entrance (bottom) and view from Franklin Field and Talbot Avenue (top). The various parts of the project are: 1. classroom wing; 2. kindergarten wing; 3. multi-purpose room (cafeteria); 4. theatre for the performing arts; 5. gymnasium; 6. swimming pool; 7. portion of the 55 acre Franklin Field playground.

"White Stallion" (upper left) shows how the Howard Claussens, '16, keep on the move in Cape Cod waters, while Ralph Fletcher, '16, (upper right) still follows the ski trails in Switzerland. The lower photos show the work of two '16 carpenters; on the left, the war chest made by George Maverick for his oldest grandson, Lieutenant Kenneth Maverick Haller, who has just come home from six months of jungle fighting in Vietnam. On the right, something for a granddaughter, the work of Leonard Stone, '16.



25th reunion album

Something new will be on display at the 53rd Reunion in June. Jessie Brophy has sent us an album that is "quite a treasure," a collection of many clear large pictures taken at our 25th way back in 1941 and put together by Steve in a handsome binder. Jessie reported in late October that she was shortly to visit her daughter in Alexandria, Va., and expected to see the *Charlie Reeds* while there. Which just naturally brings up the letter that we had received from Charlie. He writes: "Mil and I had a beautiful trip in June to the Tetons in Wyoming. We stayed at the J-L (Jay Bar Ell) ranch where our host, Mr. John Love, treated us royally. We went up to see Old Faithful one day." In August they made their usual trek to Androscoggin Lake, Wayne, Maine but this year "we extended the trip to take in the Gaspé Peninsula, P.Q., where we had to brush up on our French enough to order 'poched' salmon from the menus. I can recommend both trips to '16ers who are looking for something different."

Not one lazy bone

Speaking of reunions, we have this good message from *Barney Gordon*: "Well, classmates, it's getting time for us to be thinking ahead to our next Class Reunion, and this year Ruth and Barney Gordon's hearts belong to the Class of '16 Reunion. If at all possible, we will be there. Business continues to keep me busy, and, if anything, busier than ever before. Sometimes I wish the days were

36 instead of 24 hours long, but Ruthie tells me Congress hasn't got around to legislating in that direction yet. Our children also like to work. Both of our sons keep very busy, as do our grandchildren, is you can see there isn't a lazy bone in any of the Gordon clan. Our sons feel that there is so much opportunity for service in the world, and our older boy, besides being in practice in medicine in Washington, D.C., is an active participant in the Peace Corps program. Our younger son interests himself in numerous civic projects in Puerto Rico, where he lives. See you at the Reunion!"

Inflation

Every once in a while we run across something that really makes a deep impression—something so well done, we want to pass it on to others. We recently found a brilliant something from the pen of our *Herb Mendelson* on "Our Inflation Cancer" and with his permission we are giving excerpts from his alarming essay.

Over the past 40 years, he says, "we have done little, if anything, to completely check or reverse the insidious disease of inflation, a disease which will inevitably lead to the loss of everything we cherish, our freedom and our way of life, thus ending in chaos and then dictatorship to restore order. Our national integrity, strength, character and stamina have been badly eroded." He tells us to remember that our enemy

"is trying to stampede us into national insolvency, thus winning the 'cold war' at no cost and without firing a single shot. We must not forget what has happened to our hard-earned wage dollar in the past 30 years because, as Santayana says, 'Those who forget the past are condemned to repeat it.'"

"No matter how novel, the proposals to indulge in inflation as an aid to production and economic growth are as old as history. Throughout the ages the inflation panacea has repeatedly appeared, been tested and found wanting. Most frequently the experience has ended in a serious setback, dire suffering and privation. We no longer can permit the well-being, perhaps the very existence of our family and the generations to come, to be put into jeopardy. It's not what we earn that counts, only what we can buy with it and save from our earnings that is of any importance. . . . It's not the dollars that we put into the savings bank or into government bonds that count; what we can buy with the dollars, when we must withdraw them, is of vital importance.

"In 1940 our dollar was worth 100 cents. In 1960 it was worth 47.3 cents and in September 1968, only 39.6 cents! At two percent annual 'creeping inflation' this 39.6 dollar will in 10 years be worth about 32 cents and in 30 years, about only 22 cents! Do we want our children or our children's children to carry this crushing burden? . . . Reasonable price

stability is not in conflict with economic growth. It is an essential condition for its achievement. We absolutely do not require inflation for sound economic growth! . . . Awake from the trance, fellow Americans! Shake off the half-truths and untruths so recklessly and assiduously dished out to us by those who for so many years have succeeded all too well in anesthetizing our thinking processes. Let's remember the verity that we can't get more out of our economy than we put into it. We can't spend ourselves into prosperity no matter how worthwhile the project or legislation may be. No government can possibly create sound economic growth or wealth. It can only establish the atmosphere in which prosperity can flourish.

"Our economic growth and well-being rests solely on the ability of the people to produce more year by year. . . . Inflation is a hoax perpetrated upon us, the people, by well-meaning but inept and opportunistic leadership, pandering to man's less desirable traits. It must be clear that inflation is palpably false—a form of subtle embezzlement—resulting from devious thinking and following false gods, but what is more alarming, it is the result of moral flabbiness in the world's most affluent society."

From the letter box

Kem Dean of Houston reads the 52nd Reunion picture like this: "No change since the 50th." In early September he and Ada visited his family in Hingham and Cohasset and marveled at the changes in Boston especially around Scollay Square, "a very costly urban renewal job." Next on their travels was a visit to Ada's brother and wife in Bronxville. Says Kem: "New York seems to me to be more crowded than ever, and we ran into one of those long delays at Kennedy Airport that we have read about. About 40 planes were on the runway ahead of us and it took us nearly four hours to take off behind schedule."

At about that time we had a letter from Vert Young of Bogalusa, La., who also mentioned transportation problems.

"I am leaving for Hartford next Thursday to attend a board meeting (Trinity College; ed.), at which a committee composed of members of the faculty, trustees and student body, will present their recommendations on the handling of disciplinary matters for the college.

. . . To avoid the airport congestion in New York, I am taking the train to Chicago and catching a non-stop United Airlines flight out of O'Hare at 11:00 o'clock Friday morning. I may be delayed at O'Hare but even if we are an hour late in leaving, I can still make it to the meeting in Hartford at 4:30. I certainly am not anxious to fly through New York until the congestion is relieved, and O'Hare may turn out to be not much better. With the trains about gone, I think we really face a transportation crisis in this country."

Vert then mentioned a strictly temporary assignment in his home town late in August: "We lost our rector at St. Matthews two weeks ago and I was impressed into reading the service Sunday before last. You can tell we have gotten to the bottom of the barrel! Thank goodness, we have a visiting clergyman coming in throughout September and probably October as well."

Will Wylde reports a new winter address in Florida from early November to mid-May, from this time on: "K-6, 10th Ave., El Rancho Village, Bradenton, Fla., 33505. Last spring we bought a mobile home, one of these double width modern ones, 24 by 42 feet, very comfortable yet easy to take care of. It is located right on the golf course that Ann and I played a great deal last winter and exactly suits our short and erratic games. We will of course continue our place in Stamford, Vt., as our real home." As for others in Florida, Will writes: "I know *Wally Wolfe* and called on him in the winter of 1965-1966 to try to persuade him to come to the reunion. I also have *Dick Rowlett's* address in Clearwater and will try to get up and call on him this winter. I also know that *Emory Kemp* lives in Sarasota and *Free Clarkson* has a winter address in Bradenton Beach. I guess that is the sum of our classmates in that area, at least of those whom I know personally."

Raymond Blakney of Claremont, Calif., recalls that a year ago in October he and Laura were in Greece, chiefly visiting Pierce College, over which he presided a decade ago. (He was also President of Olivet College, Olivet, Mich., in 1950-57, before going to Pierce in Athens, 1957-60). Of Pierce he writes: "Found it booming, thanks to Uncle Sam's practice of spreading his beneficence through American institutions established abroad. Also Pierce College prospers by being a prime source of instruction in English and therefore decidedly prestigious. Back in Piigrim Place there is no end of worth while things to do beside bidding farewell to old friends who come to the end of their road through this world.

"We have a lovely little home, good neighbors and a garden that gets all Laura's time when she isn't doing something else. For myself, as before, I am a carpenter betimes and the trip to Greece awakened an interest in the Iliad which I am now somewhat painfully trying to turn into epic verse that suits me. I wish now I had taken that course in ancient Greek which, so far as I know, the 'Stute never offered! The Iliad turns out to be about the fastest-moving yarn I ever read. For the time being, try it in English prose and see whether I'm right or not. Meanwhile, as ever, my best to '16." Your secretaries will welcome any reports or discoveries that may result from your following the suggestion of Raymond relative to the Iliad.

George Maverick always seems to have something doing that is different—if he had a second middle name it would

probably be "Doing." This time he says: "Last spring I set out on the most fantastic carving project and spent most of my time in Mexico in finding hardware and some one able to do 'Aztec' dovetailing. But since coming home, Charles, my only farm help, was forced by health to quit work after 55 years with my aunt and me. So the carving awaits the quietness of winter. We keep right busy what with our farm, local activities, children and auto trips. Last month we visited our daughters in New Jersey and Boston. Tomorrow (October 15) we're driving to Lexington, Ky., to visit a mutual cousin. I am forced to admit he likes horse raising and hard liquor."

From *Fred Upton* of Lanham, Md., we have this welcome note: "About 95 percent retired but keep busier than ever on the farm and maintenance of 80-year-old house and 44-year-old tenant houses. We will have to find a new farm as Suburbia is creeping up on us. My daughter Virginia has one of her thorbreds in training and hopes to win purses."

The *Bob Burnaps*, of So. Orange, N.J., report a stay in Florida for a late-spring change of scene. He says the 52nd Reunion picture at Chatham Bars Inn is a good reminder if what a fine class 1916 really is.

Here's a note from *Bill Drummey* that sounds just like him, we think you'll agree: "Have succumbed to three-quarters of a century and am 99¾ percent retired—not that I am just vegetating—that way lies the finish. But much of my activity is boon-doggling—sit on three or four Boards of Trustees, sling oil paint, chase beautiful 'wimmin' (wonder what I'd do if I caught one!). Feel fine. Can't believe the calendar, and don't intend to. All great minds (as mine!)—Edison, Justinian, Voltaire, Newton, et alii—lived well into the eighties. Every good wish."

In *Jack Camp's* most recent letter from Mexico City he notes that those in the 52nd Reunion picture seem to be holding up well but he misses *Joe Barker*, *Hovey Freeman* and *Maurice Holland*.

Says he has a story to tell in the following setting: "Before going to Boston Tech I was working for a contractor named Thurman as foreman on the construction of a section of the first Austin Post Road from San Antonio to Austin. There were no trucks in those days and all the gravel was hauled in wagons drawn by mules driven by 'mule skinners.'" Then comes the story, but we'll just have to put it in the special folder of special stories that we take along to reunions. In a note to *Jim Evans*, Jack "recalls that in 1937 *George Maverick's* younger daughter, who is one of my 17 godchildren, received as a graduation present a trip to Mexico to spend the summer with Mother and me, and while she was there she had her 17th birthday which, if I remember correctly, was on the 7th of July."

Around and about

Cy Guething reports an enjoyable brunch given by the *Spencer Hopkins* of Bloomfield Hills, Mich., for the *Eugene Barneys* and the *Guethings*. There he says he learned that *Spence* and *George Petit* were at St. Johns together, that both are interested in baseball statistics and prophecies, and that last June *Spence* prophesied the number of games *Detroit* would win for the year and missed by just one! Speaking of *George Petit*, we have received from him what he thinks may be a "first"—two 1916 names in the same issue of the same newspaper, (and not on the obituary page, says *George*), *Frank Ross* on page 42 and *George Petit* on page 41 of the October 2 issue of the *Hartford Courant*.

For *Frank*, it is a golfing trio picture to be shown at the reunion next June and an article "Very Successful Season Reported by Golf Group," about the annual meeting of the 69-year-old Connecticut State Golf Association. The caption of the picture showing *Frank* reads: "Farewell to a Champion: *Frank D. Ross*, of the Wampanoag Country Club played his final golf tournament in Connecticut on Tuesday and matched his age with a 74 in the Connecticut State Golf Association windup at the Wethersfield Country Club. *Ross*, a former state champion, will move to Florida shortly."

The story about *George* and his statistics is, as you may have suspected, in the sports column "With Malice Toward None" by *Bill Lee*, Sports Editor. Here's what we read about *George*, called here the "mathematical wizard": "My faithful correspondent who analyzes things scientifically, *Mr. George H. Petit*, tells me the *Tigers* averaged four runs batted in per game against 3.35 for *St. Louis*; that *Detroit* had 2.53 times as many home runs as the *Cards* and that the *Tigers* scored 1.165 times as many runs as *St. Louis*. He also reveals that *Detroit* had 1.20 as many RBI's as the *Red Birds*, that 50½ percent of *Detroit's* hits resulted in runs being driven across as against 39 percent for *St. Louis* and that 11 9/10 percent of *Detroit's* at-bats resulted in RBI's against 9 6/10 for *St. Louis*. *Mr. Petit's* study concluded that *Detroit* led *St. Louis* in every category except in batting averages. This mathematical wizard gives me these figures 'for what they are worth' and then slyly adds, 'your selection is awaited with intense interest.' Well sir, I selected *Detroit* as you probably know by now, but more on their late inning charges than anything else. Besides, *Mr. Petit*, were you trying to lead me down the garden path by not even mentioning one word about pitching? Old friends, don't take me seriously. I'm only kidding. And old faithful readers, please don't bet a sou on my *Detroit* guess. I still believe they'll do it, but I don't want a nickel risked on my say-so."

We have an interesting picture of what *Howard Claussen* of *Cotuit* says we can call "Claussens' Folly," an impressive

new craft that is officially documented by the Bureau of Customs as a "yacht." *Howard* says that for him it is an electronics nightmare with all its equipment, rivalling the spy-ship *Pueblo* with: "twin screws of 500 HP; radar, Sonar and Loran; twin tower with three outriggers, derricks (not visible); powerful fire hose; full galley with electrical refrigeration; sleeps four but carries ten easily; deep draft and very rugged and fast (up to 30 mph when opened up and hull constructed like a Coast Guard cutter)." This all makes our mouth water and makes us wonder if it might possibly be anywhere near when the 53rd reunion comes around next June.

Herb and *Mary Ellis* report with relief that at last they are settled in their new retirement home in Silver Spring, Md., after about 14 months of living with their belongings in storage. He notes: "We are in a unique settlement. 'Rossmoor Leisure World' is an adult community (50 years or older) with a present population of about 1500. The section we are in has 206 apartments of various sizes on some 16 acres of land fully developed with streets, trees and parks. Our building has two floors with four apartments on each floor. Each tenant owns his own apartment (cooperative). The entire community is now about three years old and growing. We have our own golf course, club house and community center, transportation, medical department, etc."

Charlie Lawrance has had his first extended trip away from home for a long, long time. Here's how he reports it: "Been away for four weeks with *Lois* visiting children in Indianapolis, and in Ligonier, Pa. It was our first long trip since my operation eight years ago, a bit of exertion but worth while for the fun we had with eight (of the 18) grandchildren. Jet travel is an improvement over old piston-type planes for speed and comfort, and even economy, but home is the best place to be and rest. Am generally better and glad to report our families are well and happy—in Japan, California, Indiana, Pennsylvania and Massachusetts and scattered like our Class of 1916."

Charlie Cellarius says that right after the 52nd in Chatham, he went down to New Haven for a week for the 55th Reunion of his Yale class. Then: "Since then I've done very little. I retired from my architectural partnership the first of the year. Still go down to the office about once a week but mostly just to have lunch at the University Club and have my secretary write a few checks. Spend the time wandering around my garden and studying where to travel next."

And so we close for this time, with the best wishes of your class officers for a joyous Christmas and a Happy and Healthful New Year. Our warm appreciation goes out to you all for your ready responses to our little requests for bits of news and philosophy. The letters on hand from *Art Shuey*, *Don Webster* and

Harry Whittemore will be covered in the next issue. Keep on writing just a little, but often, to your appreciative secretaries.—*Harold F. Dodge*, Secretary, 96 Briarcliff Road, Mountain Lakes, N.J. 07046; *Leonard Stone*, Assistant Secretary, 34-16 85th Street, Jackson Heights, N.Y. 11372

17

Happy New Year and here's to our 52nd!

It is questionable if any other class had their 51st Reunion coincide with the 7th day of the World Series in which the *Tigers* came from behind to win. Some 85 or so (information) cards were returned and although some had no signatures, your secretary appreciates the news items thereon. The honor for attendance from the greatest distance went to *Sammie* and *Dick Lyons* of Houston, Texas. It has been many years since the Class has awarded a trophy for this, in fact *Ras Senter*, also from Texas, won it so many times that it was retired in his possession. It is hoped he still treasures it, but we would like to see him at the 52nd, with or without it. Of course it was not a gold plated one, merely ceramic.

Our congratulations to *Penn Brooks*, who phoned that he could not attend as he was celebrating the 100th birthday of his mother—wonderful. We also had a note from President *Howard Johnson* (honorary member) that other commitments prevented his attendance, however, we were honored with the presence of *Phyl* and *Don Severance*, also an honorary member, for the banquet. The doctor was kept away by *Ray Maeder*, who arrived with the trunk of his Cadillac filled with the most perfect and delicious of apples and pears. *Al Lunn* commented, "even *Johnny Appleseed* added greatly to the occasion." All credit to *Ray* for the fruit given so generously. The Planning Committee chaired by *Dud Bell* did a superb job, and it was said that the 51st was one of the friendliest we have had.

Attending the reunion were unaccompanied men *Ray Brooks*, *John De Bell*, *James Flaherty*, *George Henderson* and *C. K. Seely*. Attending with their wives were *Dud Bell*, *Ken Bell*, *K. M. Childs*, *P. N. Cristal*, *A. P. Dunham*, *S. C. Dunn-ing*, *Prof. Ferretti*, *Les Ford*, *A. E. Gilmour*, *N. W. Gokey*, *L. T. Hill*, *John Holton*, *W. B. Hunter*, *Ken Lane*, *Stan Lane*, *John Lunn*, *Lyons*, *R. A. Maeder*, *P. F. Maher*, *Dix Proctor*, *S. R. Ramsey*, *R. H. Ross*, *Mr. Severance*, *Ray Stevens* and *Al Sullivan*.

On Wednesday evening after the usual cocktail party and excellent dinner, we were treated to colored slides and movies with *Ken Childs* and *Stan Lane* officiating. *Ken's* slides showed shots taken at the 40th, 45th and 50th reunions. *Stan's* movies covered the 50th reunion and his subsequent tour of Japan and Bangkok. As a once a year photographer, your Secretary proclaims both were excellent

plus. The banquet was held at the Public House Inn and 52 classmates were present.

Awards presented

After the sumptuous dinner our able President, Al Lunn, commented on the events of the year. Namely the Bronze Beaver citation to the Class of 1917 accepted in San Francisco by Ray Brooks. The silver bowl award of the American Alumni Council to our Alumni Association was accepted by Al Lunn as chairman of the Long-Range Planning Committee of the Institute. Tubby Strout, our Class President 1947-1952, presented Al Lunn with a handsome gavel to replace an aluminum one he had presented at end of his term to Stan Dunning and which he in turn had passed on. Our esteemed architect, pianist, and bachelor, Jim Flaherty, presented to Al Lunn for meritorious service, a painting he had made of the main entrance as seen from the center court. Bill Hunter commented that Jim Flaherty was also the best dressed man. The only bit of sadness was Al Lunn's remark that since the 50th reunion, 14 of our Class had gone to their reward. Then with the thought of the widows in mind, he offered a colored photograph of Nelson Chase's mural to be raffled. While your secretary was making the collection his wife pulled the winning number which was his—collusion you say?

Reunion planning

Then followed a discussion of the location of the 52nd and 55th reunions. Ken Bell suggested Bald Plate Inn at Melvin Village, N.H., for the 52nd. As to the 55th, the sentiment was for it to be held on Cape Cod. A committee is to immediately make a study and report, and the 51st came to an end officially at 9:05 p.m.

Around and about

In the November notes we mentioned the passing of Paul Flagg. Further information furnished by Don Serverance, advises, "I came back today from Chicago and while there I learned that Flagg's wife pre-deceased him in November, 1967. Flagg had a sister somewhere in Pennsylvania and a brother, also in Pennsylvania."

Charles A. Abels residing in Andover, Mass., writes, "Thank you very much for being trouble shooter in the matter of the misguided *Technology Review*. The missing issues have arrived and I no longer feel neglected, nor an outsider in the fast moving drama of today's Technology. As to my promise to sing the Stein Song, solo, at one of the class reunions, I regret to have to say that both Mrs. Abels and I have been physically unable to take part in any outside activities for several years due to arthritis. This is no excuse for my not contributing to the class notes. My only defense on that score is that I have nothing particularly interesting to write about, more or less confined as we are to our apartment in Andover, to which we moved when we sold our Tewksbury home last June, 1967."

From Tharratt Gilbert Best: "1966-1967 have been outstanding years in my existence. I was elected to the Minute Men—40 years in the army and A. F. reserve, was honored locally in "This Is Your Life" broadcast, organized a big centennial celebration for the 1st National Bank of Boonville, N.Y. of which I had been President and Chairman of the Board for 40 years, visited the Far East on an eighty-day cruise, completed the 30th and last tax map of this village taking seven years of labor, and was the recipient of several other honors."

William W. Eaton of Los Angeles, Calif.—"My wife, (a Wheelock girl, whom I courted at M.I.T. has one extra curricular activity) and I came to California in 1940 when I became associated with my cousin, Hubert Eaton, who was the founder and owner of the magnificent Forest Lawn Memorial Park, of which you have doubtless heard. Hubert at that time was starting an insurance company, and I was president of that company for 18 years, retiring in 1958. Since my retirement, my wife and I have been fortunate in being able to travel extensively and have had, at least so far, an enjoyable and rewarding retirement."

Carl and Christine Dean of Laguna Hills, Calif.: "In 1917 I enlisted in aviation division Signal Corps, but furloughed back to industry. Later given a commission as Captain in the Chemical Warfare Reserves. Worked in production for many years for Monsanto, but ended up as director of Engineering Sales Department. After retirement continued as consultant for several years. Now retired in southern California with main interest chess, bridge, camera and travel. Have a urologist son with four children, a daughter nearby also with four children. Unable to attend the 51st as expected to be in Turkey on an I.E.S.C. project, (International Executives Service Corps)."

Louis P. Sanborn, Saugus, Mass. "Early in 1967 I felt very poorly, although the doctor found nothing wrong. I cancelled my usual trip south and put off doing anything about the reunion for weeks. Finally I felt so miserable I wrote I definitely would not be at the reunion. I had no premonition, but later the very day I wrote I had two massive hemorrhages, followed a little later by three more. Hospitalization followed, but no operation. X-rays showed no growth and doctor figured that there was seepage caused by a combination of diverticulosis and polystythemia, both of which I have had for a number of years, and that the internal bleeding might stop. Apparently that is what did happen. Naturally loosing so much blood, I was in a very weakened condition and it took me about six months to return to somewhere near normal. I never did get back 100%. During the six months period I felt I did not have the necessary energy and drive so I resigned as president of the bank. I have however stayed on as director of two banks and as a member of the security committee of

both. I get to meetings and spend one afternoon a week appraising properties. I get around locally, but am still timid about taking any trips."

L. E. Schoonmaker of Gainesville, Florida: "My wife and I have just returned from two months in England. Did a little sight seeing, but mostly visited with wife's relatives."

Walter G. Whitman, Scottsdale, Arizona: "Your personal note as class agent (Ray Brooks) brought warm memories of earlier reunions, and twinge of regret that we could not come last June for the 50th. We feel that we are rather permanently settled here since our three children and their families are so scattered in Arizona, London, and northern California. Retirement is even more fun than working. I did not garden or play golf during my first 70 years. Now Martha Ann and I do both with very limited skill, but with great enthusiasm."

Al Lunn broke away from the Alumni Conference, flew to Hawaii for a nine-day vacation with his children, and since has reported a good time had by all.

Thorndike Saville, a consulting engineer of Gainesville, Florida, has for sometime been a consultant in water problems to the new Disney World being developed in Florida. The project occupies 43 square miles and will cost \$600,000,000.

Charles G. Miller: "I am still reasonably active but officially a retired Bell System engineer since 1957." . . . Edward D. Sewall, Oneida, N.Y. ("Nig") expounds: "Me I am soree I don come ou de Juble dees tam. Prapz maybe I com nodder tam yes."

Lydia Mehaffey, widow of "Potts", writes: "I left Djakarta three weeks ago with daughter and family, spent two weeks in Singapore and am now on Dutch freighter "Sloterkerk," anchored off Bangkok. I am the only passenger on board. We stop in Formosa and Pusan before reaching Yokhama May 9th. I am staying on until Kobe as I prefer ship life to hotels.

"I really want to get home by June and golf weather at the mountain cottage. Have an electric cart now, so keep playing even on mountain course. No fool like a old one. At least I am still kicking even though there aint as much dust as there used to be. Came out from L. A. to Sidney on a P & Q ship, too many people. Enjoyed Suva, Auckland, Sidney, and Melbourne. Travelling alone not as bad as I expected, should have tried it long ago."

Changes of Address,

Luther M. Lauer, 65 Crescent Drive, Orchard Park, N.Y. 14127; Charles E. Plummer, 450 Vandever Street, San Diego, Calif. 92120.

—C. Dix Proctor, Secretary, PO Box 336, Lincoln Park, N.J. 07035; Stanley C. Dunning, Assistant Secretary, 6 Jason Street, Arlington, Mass. 02174

I undertook the responsibility of becoming your secretary with considerable misgivings—not alone for the challenge to maintain its high literary style, but also to gather enough information to make these notes interesting to you. I can now report that there is a satisfying reward for my feeble efforts in the warm letters which I received from you. In particular, I find there is always a story in your personal histories, past and present, which is worthy of publication, but also makes stronger the bond that ties us together as Eighteeners. Keep writing to me—I will do my best on this end.

An unusual man and artist

In this mood, let us start with *Samuel Vance Chamberlain*, who wrote the words and music for many songs in the Tech shows of our undergraduate years. We congratulate him on his receiving a well deserved recognition on September 29, 1968. On this occasion, he was awarded his Master of Arts degree from Marlboro College, Marlboro, Vt.

A review of his many achievements would take pages. Fortunately, his most recent book *Etched in Sunlight*—I recommend it to you as “must” reading—does the job beautifully. Suffice to record that it relates his career as etcher, photographer, gourmet, book collector, and inveterate traveler. He has authored many books, and he completes the job by doing everything but the actual printing himself. It has been my good fortune to have seen him more than many of you, and I can record that here is an unusual man and artist, with a unique sense of beauty—an innately modest person, a human being of great charm, and most of all, Sam is genuinely warm hearted.

A magic name

There must be something magic in the name Samuel Chamberlain, for we also boast Samuel Harrison “Chink” Chamberlain (no kin) who graduated in Course II. Among his activities was his interest in our Cadet Corps becoming captain in his senior year. (Remember us dressed in our dinky uniforms so dapper and so neat?) He also taught Canadian Bayonet Drill to Ground Officers of the United States Air Force at M.I.T. After World War I, he joined the I.B.M. Corporation as engineer, and became patent attorney for them in New York. A spinal injury caused by being struck by an auto made it difficult to sit at a desk for long periods, so “Chink” moved to Plymouth, Mass., where he bought out a half interest in a curtain business. Now retired, he and his good wife, Esther, take a lively interest in the world around them, including a daily visit to his mother now 102 years old.

“Chink” is responsible for news of *Stuart Elliott* who started at Harvard, transferred to M.I.T. in 1915, and then enlisted in the United States Air Force in 1917, becoming a fighter pilot. He now lives in San Rafael, Calif., with interests



Samuel Vance Chamberlain, '18, an unusual man and artist.

in mining but he has a warm spot in his heart for Massachusetts as he expresses it in this excerpt from his letter. “I see you live in Plymouth. I was born in Osterville, in the old Gaff house, built in 1885 and still lived in. It is across East Bay, about one mile from the Wianno Club, where I raced boats and attended dances for many years before W.W. II and air force service finally located me in California—an inferior place to live compared with the Cape, in my strong opinion. I well knew Plymouth, especially riding a horse from Boston to Osterville in 1911. I was in the cavalry of the State National Guard, and was bringing back my horse after manoeuvres. I spent the night sleeping in the hay just outside of Plymouth, and the horse munched the hay off the stack I slept in. For supper, I had a sandwich and the night cost nothing. The roads were mostly unpaved all the way, and I met perhaps a dozen cars—then referred to as devil-wagons—chugging along on the whole 80 mile trip. *Them* was the days. I also sailed clear around the Cape in a Wianno seiner, and anchored one night off Plymouth, and we kids then, felt like voyagers on the *Mayflower*!”

A relative of Jesse James

We continue in our safari around the country with a welcome epistle from *Ernest Giles*, Hillington Ranch, Texas. He graduated as an architect, and I presume all the Texas size buildings are his design. During his undergraduate days, his avocation was wrestling, which culminated in his being captain of the team in his senior year. No doubt this experience served him well in securing a strangle hold on desirable architectural contracts. He enjoys a vicarious thrill in travelling as you will note in this excerpt from his letter.

“A long time ago, my grandfather John James, a distant relative of Jesse James, drove a herd of 2,000 long horn steers, from San Antonio, Texas to San Diego, California. The year was 1850, steers cost \$15, in old Mexico and were selling in California for over \$100. Gold had been discovered in California and beef

was in demand. He brought these steers through Laredo, Texas and drove them through Indian infested country to California. The market had dropped when he got to San Diego, but he sold them for about \$50 apiece and was paid in gold. Fearing to ride home with all that gold, he caught a ship in San Francisco and went around Cape Horn to New York where he deposited his gold in a bank and rode the train to St. Louis where he bought a horse and rode the rest of the way home, being gone 18 months from San Antonio. Now the point that I am making is that when he passed by the place now know as Yuma, he watched a dance at the friendly Yuma Indian camp. He said that there were a group of the oldest human beings there that he had ever seen. There were about twenty old Indians watching and enjoying the antics of the warriors dancing in their war paint. They would applaud by saying “Hump” in unison. My grandfather looked at these old Indians and was amazed at their wrinkles. Their faces were so wrinkled that it was difficult to see which wrinkle their mouth happened to be in. He said that he was confident that most of them were over 110 years old. He often wondered how these creatures had lasted that long. It seemed as if the grim Reaper had just given up trying to harvest them.”

Around and about

We are happy to pass on news of *Harry Le Vine* through the International Executive Service Corps. This group of retired business men serve voluntarily in foreign countries. They give their skills and experience for constructive use by the fledgling industries in these undeveloped lands. Harry has been doing his stint in Nicaragua in the administration, planning and marketing of air conditioning equipment. Harry's business career was in Detroit where he organized the Atmospheric Control Company from which he retired in 1961. Now living in Florida, he is President of the M.I.T. Club of Southern Florida and Regional Chairman M.I.T. Educational Council, Southern Florida. He is also active in the Score Council of Business Administration. The M.I.T. line is strong—son Burton graduated in 1947 and grandson Neil will graduate in 1970.

With your permission—and I am sure I have your unanimous affirmative vote—I nominate Professor Arthur C. Hardy as an honorary member of the Class of 1918. A graduate of the University of California, he became a professor at M.I.T. and retired in 1961. He became a life member of the Alumni Association in 1937 (somehow he was assigned to the Class of 1918 which record still stands). He made a substantial contribution to our Fifty-year Gift. He states he has masqueraded as a member of the Class of 1918 all these years, but Professor Hardy, worry no more. I have just made it legal. Welcome.

A note from Ted Brataten acknowledging receipt of the class picture states that he and his Eunice are looking forward

to our 55th. Of more immediate interest are their plans for this winter—they leave by freighter for Amsterdam by way of the Caribbean Islands and South America, then on to Dubrovnic on the Adriatic and finally back to London. Sounds exciting, have fun; we are all awaiting a first hand report from you.

Just received a resume from our most inveterate travellers, the *Thomas Brosnans*. They have visited every state in the nation, all of Europe except the Soviet Union and its satellites, Africa, the Near East, Asia, and South America. What is left, Tom? Last summer it was Norway, Lapland, and Iceland. I wish we had the space to print this most interesting, analytical, and historic report; it is all intriguing.

I had a chance for a brief chat with Carl Blanchard at the M.I.T. Faculty Club. He was a participant in a meeting of the M.I.T. Corporation Development Committee. Anything to report, Carl?

Prexy *John Kilduff* was a most genial host several Sundays ago at the Salem Country Club to the Fletchers, Howes, and Seltzers, a most enjoyable and festive get-together.

Deceased

It is with deep sorrow that I report to you the death of Carolyn Magoun. She graced many of our class functions with her Alexander to whom she was a constant helpmate and inspiration. . . . We note in the local papers that *Byron R. Cleveland* passed away on November 5, 1968. He was a graduate of Course II, and after graduation became associated with J. H. Horne & Sons Company, Lawrence, Mass., makers of paper mill machinery—a family owned business founded by his great grandfather and of which he became president and treasurer. In addition to enjoying the challenge of designing and building new machinery for the trade, he also served as Vice President and Chairman of the Finance Committees of several Lawrence banks. He is survived by his widow, Ruth Donovan Cleveland (Wellesley 1919), a son, a daughter and six grandchildren. . . . Keep the news coming my way.—*Max Seltzer*, Secretary, 87 Ivy Street, Brookline, Mass. 02146

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As we enter 1969, going on 1970, which is the magic and golden year for '20, your Secretary wishes each and every one of you a New Year of uninterrupted health and one filled to the brim with happiness and contentment.

A lively class

The Class continues to move around in lively fashion, with the trend toward the south, as has been the rule since retirement. *Scotty Wells* boasts a glamorous address, Box 92, Cypress Gardens Post Office, Winter Haven, Fla. *Harold Hedberg*, who retired three years ago as Vice President of Albany Felt Company,

Albany, N.Y., may be found at Cocoa, Fla., 409 Riverside Drive, South. Not far from there resides *Bat Thresher*, in Apartment 311-N, 2020 North Atlantic Avenue, Cocoa Beach. Bat is serving as Vice Chairman of the Commission on tests set up by the College Entrance Examination Board which is now engaged in a three year study of educational tests in the light of the increasing public criticism of tests and their use. Bat continues to do some writing and speaking in the field of education, a subject on which he is universally regarded as a foremost authority.

Archie Kinghorn has migrated to the Pacific Coast, address: Apartment 205, 1555 Oxford, Berkeley, Calif. We'd like to hear from you, Archie. On the other hand, that rugged individualist, *Charles E. Packard*, formerly a professor at Randolph Macon College, Virginia, reverses the trend and locates in Jefferson, Maine, Box 941. The last we heard of *John DeMeulenaer* he had retired as Division Engineer, P.W.D., Bridge and Highway Division, City of Boston. He continued as a consulting civil engineer up to a year ago. Write, Please, John.

Sam Schenberg, the distinguished Director of Science with the N.Y.C. Board of Education, plans to go on terminal leave a year from now, after 47 years of continuous service. After that, he hopes to keep on as an educational consultant. More power to him. C. T. *VanDusen* retired from Detroit Edison Company and now serves as Trustee of Cranbrook Schools, Waltham Beaumont Hospital, Arnold Home, and Camp Oakland.

From the letter box

It was good to hear from "*Dusty*" *Miller* who reports that after 31 years with Johns-Manville and four years in electrical equipment distributing, he is now Travel Director of the Arizona Automobile Association which involves traveling to South America, the South Pacific, the Middle East, and, says Dusty, "I hope to be at our 50th anniversary in Cambridge." That is indeed good news.

A line from the ubiquitous *Norris Abbott* reports that he had a good golf match with Phil Byrne while on his annual sojourn at Severance Lodge, Kezar Lake, Maine.

Classmate deceased

Our Class suffered a grievous loss in the death last summer of *Herb Bates*, of 65 Fairfield Street, Brockton, Mass. Herb was President of the M. H. Bates Company, having retired in 1965. He served for many years on the board of directors of the Security Federal Savings and Loan Association and was Vice President for the past 10 years. Surviving him are his widow, Marion, a son and two daughters and three grandchildren. Herb was a faithful attendant at class reunions and was widely and favorably known to his classmates. I am sure I speak for the Class in expressing heartfelt sympathy to his family.

Like father like son

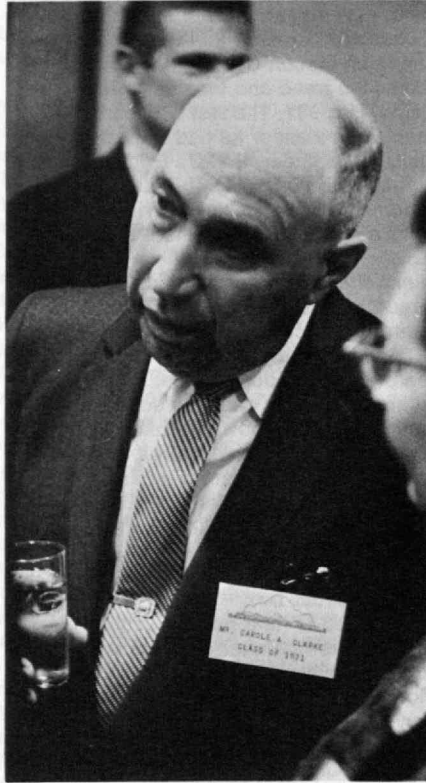
The *Winchester Star* carries news of the son of one of our popular and respected classmates, *Mal Lees*. Nelson C. Lees has been appointed Director of Development at M.I.T. He will be responsible for coordinating planning, reports and records relating to the development program. *Mal Lees* once lived in Winchester so his son may be considered a native of the town. After graduating from the Institute in 1953, Nelson returned there following service in the U.S. Army as Assistant Director of Public Relations. He was editor of the M.I.T. Science Reporter series on TV. He is married to a charming Parisian girl. Mal has every right to be proud of him and of his association with M.I.T.—*Harold Bugbee*, Secretary, 21 Everell Road, Winchester, Mass. 01890

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Happy New Year! Only a little over two months from now, the Class of '21 will be enjoying its third interim reunion in Mexico, in conjunction—appropriately—with the 21st annual Fiesta of the M.I.T. Club of Mexico City, scheduled for next March 13 through 15. At the date of writing these notes, you have just received an interesting letter from our adopted classmate, *Howard W. Johnson*, President of M.I.T., and another from Class Prexy *Ray St. Laurent*. Ray tells of '21 progress for our 50th reunion in 1971, the interim reunion this year, our fifty-year gift to Technology, and makes a plea for your letters to us to maintain this class news. Enclosed with Ray's letter was a form you should have mailed by now to Chairman *Al Lloyd* (address at end of these notes) to tell him you and your wife plan to be with us in Mexico. Only those who return the form will receive later mailings, so dig it out or phone Al at 401 596-4142. We just did and he says a large number of returns are already in at this very early date.

President *Armando Santacruz B.*, '54, of the Mexico City Club has written, in part: "The program now being confirmed will start with a registration get-together at the University Club on the morning of March 13, followed by choice of a trip to famous colonial buildings or a tour of the Olympic Games sites, both guided by members of our Club. Luncheon and brief ceremonies at the University Club will provide time for everyone to get acquainted. Late that afternoon, we will all probably go to the Pyramids at Teotihuacán for the dramatic 'Sound and Light' presentation of the history of the Sun and Moon Pyramids, which takes place after dark. A special trip will be announced later for Friday morning and we may have lunch in Texcoco at the popular do-it-yourself bull ring restaurant, Cortijo de la Morena, where you can try your luck with the small bulls if you wish. That evening, President *Howard W. Johnson* will deliver an address at the Mexican-North American Institute of Cultural Relations, followed by a recep-

Members of the Class of 1921 honored Princess Ubolratana Mahidol (below), the daughter of the King and Queen of Thailand, at a reception in Cambridge on November 8. Among those present were Irving D. Jakobson (right, visiting with two Boston-area Thai students), and Carole A. Clarke, Secretary-Treasurer of the Class (below, center).



tion for all in attendance. On Saturday morning, a new program event has been planned at a special 'Charreda,' in which lady and gentlemen *charros* display fancy horsemanship, roping, singing and dancing. The 'Noche Mexicana' that evening is the gala climax of the Fiesta, with dinner, dancing, entertainment in a lovely decorated garden and our Club members dressed in typical costumes of various regions of Mexico. Try your hand at demolishing the huge M.I.T. beaver *piñata*. Our program will allow time for other sight-seeing and shopping and we hope all of you in the Class of '21 will join us." Maxine and your Secretary are planning to revisit the lovely Taxco and Cuernavaca areas before the Fiesta and afterwards to make a circle tour north and west of Mexico, D. F., possibly as far as Puerto Vallarta, named for the grandfather of our famous classmate, *Manuel Sandoval Vallarta*. Can we help you?

Housing progress

If you have not been in Cambridge re-

cently, Howard Johnson's letter must evoke amazement at the progress in student housing with the new 30-story Eastgate apartments, complete with nursery for married students, as well as the sore need for more modern housing, evidenced by leased Random Hall on Massachusetts Avenue. Partly through your generous support of the Amity Fund, temporary residences are being eliminated, new construction and renovation are possible and extensive assistance given to fraternities and other housing groups.

Reception for Thai Princess

The Class of '21 sponsored a reception and dinner at the Faculty Club last November as a mark of esteem for our late classmate, Prince *Somdet Chao Fa Mahidol* of Songkhla. The guest of honor was his granddaughter, Princess Ubolratana Mahidol, daughter of King Bhumibol Adulyadej and Queen Sirikit of Thailand. She is studying at Concord Academy with the objective of entering

M.I.T. next fall to study nuclear physics and perhaps indulge the major diversions she shares with her father, sailing and music. Invited to meet the Princess were the twelve students from Thailand currently at M.I.T.; a group of Thai students comprising the executive committee of the Thai Students Association of Massachusetts; the Thai Consul of Boston and the charming couple from the royal household who serve as chaperones to the Princess. Representing M.I.T. were President and Mrs. Howard W. Johnson, Vice President and Mrs. Vincent A. Fulmer, Professor and Mrs. Roland B. Greeley, Professor and Mrs. Gerald N. Wogan, Professor and Mrs. Lucian W. Pye, Mr. and Mrs. Peter D. Leavitt and Mr. and Mrs. Kenneth S. Brock. Present from the Class were Becky and Elmer Campbell, George Chutter, Maxine and Cac Clarke, Maida and Ed Dube, Irv Jakobson, Chick Kurth, Joe Morrell and Paul Rutherford. Helen and Ray St. Laurent were unable to attend because of his hospitalization. Cac Clarke welcomed

the guests and gave a brief account of the Prince's studies in Public Health in behalf of his countrymen. He called upon Elmer Campbell for his recollections of Prince Mahidol and read a cordial letter from the retired Educational Counselor of the Royal Thai Embassy, Washington, Luang Videt-Yontrakich, '24. As a result of the thoughtful courtesy of *Ed Farrand*, a beautiful silk flag of the Kingdom of Thailand was presented by *Cac* to the Thai Students Association through its president, Chumpon Surin-traboon, a graduate student in Architecture at M.I.T.

Alumni Seminar

The Alumni Seminar last November, "Computers in the Service of Society," took the form of discussions of computer technology applied to the individual in terms of his life at work and as a member of society; in augmenting learning processes as well as expanding intellectual capabilities and communication; in its effect on knowledge and power balance in society and in the advancement of specific fields, such as architecture. Present at the three-day event were: *George A. Chutter* and *Joseph C. Morrell*. *Pearl* and *Albert H. Wechsler* were registered but our faithful correspondent, *Joe Morrell*, didn't get to see them. *Helen* and *Ray St. Laurent* were also registered but were unable to attend when *Ray* underwent a medical checkup and the need for an immediate major operation was discovered. He is making a fast recovery and will greatly appreciate your good wishes, which can be addressed to 47 Gerard Street, Manchester, Conn. 06040.

50th reunion plans

George A. Chutter, Chairman of our 50th Reunion Committee, held a well-attended meeting of the group early in November at M.I.T. The organization was expanded to provide leadership for a number of items which have been added to the long-range planning for the predominantly on-campus weekend, starting about June 10, 1971, the actual anniversary of our graduation, and continuing through the 1971 Homecoming events on June 14. Acknowledgment was made of the aid and guidance received from *Harold F. Dodge*, Secretary of the Class of '16, and *James M. Evans* of the '16 Executive Committee, based upon their own outstandingly successful 50th reunion. Present at the luncheon and meeting in McCormick Hall besides *George*, were: *Mich Bawden*, *Cac Clarke*, *Josh Crosby*, *Ed Dube*, *Irv Jakobson*, *Joe Morrell*, *Paul Rutherford*, *Ev Wilson*, *Royal Wood* and *Panos D. Spiliakos*, '66, the new Assistant Secretary of the Alumni Association. Class Prexy *Ray St. Laurent*'s illness prevented his attendance.

Around and about

Harold H. Cake, 5046 S.W. Hilltop Lane, Portland, Ore. 97221, is President of the Equitable Savings and Loan Association, Portland. *Cookie* is President of the Oregon Savings and Loan League, President of the Oregon Section of the Insti-

tute of Electrical and Electronic Engineers and National Vice President of the Purchasing Agents Association. His memberships include Rotary, University Club, Waverley Country Club and Multnomah Athletic Club. He and *Alice* have a married daughter and two grandchildren. . . . *Albert E. Fowler*, 432 Van Holten Rd., Somerville, N.J. 08876, former owner of the Band Box, Newburyport, Mass., has retired. He and *Helen* have a son, *Richard P.*, M.I.T., '49, who is senior research engineer at the Johns-Manville Research Center, Manville, N.J.

Carl W. Hammond, 1107 Mariposa St., Vallejo, Calif. 94590, has been safety director and value engineer of the Mare Island Division, San Francisco Bay Naval Shipyard for almost 25 years. He has been chairman of the San Francisco Chapter of the Veterans of Safety and is active in the Commonwealth Club. He and *Henrietta* have two married daughters, *Carol*, Mills College, and *Carrie*, University of California, and four grandchildren.

Saul M. Silverstein, 28 Stephen Street, Manchester, Conn. 06040, board chairman of Rogers Corp., left last September on his 26th trip abroad since 1952, according to a clipping received from *Ray St. Laurent*. *Saul* spent eight weeks on company matters in the Far East and made a lecture tour in Hong Kong, Japan and Korea before spending several weeks at the new Rogers plant in Chandler, Ariz. *Saul* joined Rogers as Technical Director of the plant in Manchester in 1930 and was elected Vice President and General Manager in 1938. He became President in 1946 and Chairman two years ago. Under his direction, Rogers expanded into diverse insulation, plastics and molded materials fields. His far-seeing ideas on management brought invitations from the Council for International Progress in Management to present them on foreign lecture tours; he has since served the organization as Vice President and Director. He is also a member of the International Enterprise Fellowship Program and the *Council International pour l'Organisation Scientifique* and has lectured abroad in the interest of good management for both of them. His lectures and the seminars he has led have taken him to groups of industry, labor and government in some 22 countries in Europe, Scandinavia, the Near East, the Far East and behind the Iron Curtain. *Saul* was honored as the 1961 recipient of the Human Relations Award of the Society for the Advancement of Management. He has also received citations from the Junior Chamber of Commerce, the Veterans of Foreign Wars, the Diocesan Labor Institute of Hartford, Conn., the Jewish Theological Seminary and the Turkish Government. He and *Rigi* have a married son, *Lee*, Boston University and Harvard; two married daughters, *Phyllis*, Wheaton, and *Barbara*, Wheelock, and five grandchildren.

Maida and *Edouard N. Dube*, 216 Woburn St., Reading, Mass. 01867, are

receiving congratulations on two important events. On September 18, *Melissa Maida Bochman* made her debut at the home of their daughter, *Caroline*, and her husband, *Bruce*. *Melissa* has two older brothers and is the thirteenth grandchild in the *Dube* family. On October 20, *Maida* and *Ed* celebrated their 45th wedding anniversary with all four children and the grandchildren. Their second daughter, *Anne Louise*, had a serious operation and is slowly recovering; the oldest, *Lucienne*, is now librarian of the Falmouth, Maine, schools. *Ed* continues his consulting engineering practice but commutes to his Boston office only three days a week—a concession to *Maida*'s insistence that he tackle the never-ending backlog of duties at home and in their community—as well as for the Class of '21 as a Class Agent and Co-chairman of our Interim Reunion Committee.

From the *Simmons Review*: "Virginia (Hurlbut) Johnson and her husband, *Philip M. Johnson*, a retired colonel, U.S.A., are on a trip to Florida, with tentative plans for New Orleans and Mexico." We hope those plans refer to our '21 Interim Reunion in Mexico next March. The Johnsons live at 41 Norwood St., Portland, Maine 04103.

Sharing a trip abroad

We promised you *Betty Hayward*'s account of the trip which she and Assistant Secretary *Sumner Hayward* made last summer. Here it is, with condensations which impair *Betty*'s expressive style but leave, we hope, the essentials of her review: "Sumner said I might send you some bits and pieces of our doings in England, Wales and Ireland. We flew to London April 25 and back from Shannon June 3. In that forty-day stretch we stayed in London, Cheltenham, Chester, Dublin, Killarney and Limerick. The rains came in England and when we reached *Eire*, where we'd been warned to expect wet, cold weather, it was nearly always sunny. The seven plays and two movies we saw in London kept us entertained and out of the wet. Sumner was given the red carpet treatment when he visited a telephone "open house," plus passes for the B.B.C. tower and a special tour. From Cheltenham we revisited the Cotswolds, an area that most Americans enjoy. Here, when I remarked that one of the pieces of fine china on display looked like a worm, the proprietor said: 'Actually, it is a worm. It didn't sell well until we renamed it the Loch Ness Monster. Now we can scarcely keep enough in stock.'

"In Chester, one of the few cities where Roman walls still mark the original boundaries, we walked completely around them. The stones were laid about 75 A.D. and, for those of us who struggled through Latin, it's a thrill to see and set foot on them. The top of the walls affords glimpses of men replacing turf on a grass race track; a new police building so modern it looked as if it came from the Guggenheim Museum; swans on the River Dee; school girls rushing out to

Three '21 classmates; (from left to right) John B. Mattson, Saul M. Silverstein, and Elmer W. Campbell.



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play hockey; and endless backyard gardens in which the English make the most of every square inch that can be persuaded to produce blossoms.

"That forbidding black mass, Mt. Snowdon, the little streams, the fields dotted with sheep and wildflowers, signposts with baffling names on them—these were the minor joys of Wales. A major one, and one of the high spots of the trip, was a class of young girls singing. We had heard the Welsh aren't especially demonstrative but that they will go to considerable trouble on behalf of visitors. So, when we stopped at a school and asked if we might hear some choral singing, the music mistress was quick to assemble a group and the headmaster told us: "We've sent the best musician in the school home to get his oboe." The girls and the boy performed exceptionally well as the pretty music mistress directed with firm control. 'Dear, dirty Dublin,' say the Irish, describing what we saw of the capital better than the ballad that starts, 'In Dublin's fair city the girls are so pretty.' Delights were the Abbey Players and the Irish cabaret at Jury's Hotel, where singers, dancers and harpist, together with a magician who had the gift of gab as well as quick fingers, put on a performance of Irish lore and fun.

"With my library background, I was also much taken with Dublin's treasure, the Book of Kells, an illuminated manuscript rescued by monks after it had been stripped of its jeweled gold cover by invading Danes. In my enthusiasm to learn anecdotes about the Book from one of the knowledgeable guards, I failed to buy any of the post cards picturing individual pages which would have made fine additions to my collection of library post cards.

"County Kerry, with its Lakes of Killarney and its mountains, is exactly as advertised—scenic and serene. We spent 10 days there, seeing it on foot, in jaunting cars and by taxi. Sumner took a trip through the Gap of Dunloe and made pictures of the variety of woods and bodies of water.

"A meeting of the Trades Union Congress was held at our hotel in Killarney.

Sumner was invited to join them when the men went into the bar after dinner to sing. Soon a voice called out: 'And what would our friend from New Jersey like to sing with us?' To the response: 'The Sidewalks of New York' it turned out not a soul except Sumner knew Al Smith's theme song! His solo performance brought applause. One of the songs had such a fine swing I've tried to buy a recording; it starts: 'We're off to join the I.R.A.' and the chorus begins: 'We'll march to Dublin in the green.'

"As always, I kept an eye out for post cards for my collection. Of course, we visited art galleries and cathedrals, went to concerts and saw the usual sights but nothing was more interesting than talking with the people.

"For Sumner, a 100 per cent Yankee, and me, just 50 per cent, it's part of the fun to shed our innate reserve and discover what people who live in other places are like." Sumner adds a post-script: "I did go on a few one-day trips by myself, including Brighton, where I saw colorful abstract 'sculpture' opposite the Royal Pavilion with the 'onion' domes; by boat on the Thames to the magnificent gardens of Hampton Court, Cardinal Wolsey's palace; and to Bath, where the old Roman baths still steam away 1900 years later."

Letter box

Decker G. McAllister is chairman of Pacific Scientific Company, which has moved from San Francisco to enlarged quarters at 888 Industrial Way, San Carlos, Calif. 94070. Mac says he is quite active in his own company and also as a director of Varian Associates and Oxford Laboratories. He is a Director of the Strategic Industries Association and Chairman of the trustees of the California Academy of Sciences. He has a son, Decker, Jr., M.I.T. '54.

Herman B. Thompson, 674 N. 59th St., Omaha, Neb. 68132, writes that he retired in 1964 as Chief Engineer of Mossman Construction Company, engaged in channel and repair work on inland rivers. His retirement interests include Kiwanis, the Omaha Athletic Club, Omaha Engineers Club, and Lincoln University Club. He and Hazel have

a married son, Edward, Baker and Omaha Universities, and two granddaughters.

A note from Anne and **George Schnitzler**, tells of leaving their Chestnut Hill, Mass., home in late November for winter quarters at 1076 Venetian Way, Miami, Fla. 33139.

Via **Ray St. Laurent**, and Class Vice President **Irv Jakobson**, we have a long letter from Dr. **Elmer W. Campbell**, Lovell, Maine 04051, who has taken a lot of his time to drop in on classmates in the path of his travels. Elmer was in the hospital last September for an operation and says he has now fully recovered. He reports, in part: "Visited Comdr. **Glenn H. Easton**, U.S.N., retired, of South China, Maine 04358, and met his lovely wife. Had a grand time and, although I didn't know him at Technology, we had many common interests—I was an ensign in the Navy in World War I and he had lived in Ann Arbor, where I obtained my doctorate in Public Health at the University of Michigan. **Brainerd M. Jacobs**, Wicasset, Maine 04578, and his lady were attending an antique show in Bath, so I missed them. Learned they plan to move to Readfield, where I'll look them up later. Also missed seeing **Edward P. Clark**, South Bristol Rd., Damariscotta, Maine 04543, who had gone to his seashore cottage. Colonel **Harold O. Bixby**, lists his address in care of his daughter, Mrs. Dudley Hughes, West Gray, Maine 04039, since he travels and is seldom at his home, 100 Memorial Dr., Cambridge, Mass. 02142. Bix is planning to move to Twin Towers, Cocoa Beach, Fla. 32931. At Gardiner, I drove some eight miles off the main road to Pittston, to see **Willis L. MacComb**, Box 159, R2, Gardiner, Maine 04345, the retired principal of Bridge Academy, Dresden, Maine. He has a blueberry farm as a retirement project."

We certainly appreciate Elmer's efforts to maintain class bonds of friendship and his grand contributions to these columns. Graduated with us in Course VII and retired in 1965 as Director of the Division of Sanitary Engineering, Maine State Department of Health and Welfare, Elmer also headed the

State Plumbers Examining Board and the State Board of Barbers and Hairdressers. His department was responsible for operating extensive toxicological, radiological and analytic chemistry laboratories in the interest of every conceivable form of environmental sanitation with respect to food, lodging, water, industry, schools, radiation and many other fields. He continues in retirement as a member of the Maine State Board of Emergency Resource Mobilization and Director of its Water Division.

One-time mayor of Hallowell, Maine, he served in both World Wars—on the U.S.S. Rhode Island in the first one and as major, U.S.A.R., and sanitary engineer of the Okinawa Command and hospitals of the 32nd Medical Center in World War II, amassing seven ribbons, including the Bronze Battle Star (Okinawa). His memberships include a dozen prestigious professional societies; he is a fellow for life in several. Of his half-dozen social affiliations, he is a former President of the Augusta Rotary Club and he served for five years as president of the M.I.T. Club of Western Maine. He has written more than fifteen technical papers relating to health, sanitation, water supplies, toxicology, plant poisoning and radioactivity. He married the former Rebecca C. Koferl of Lovell, Maine, and has three married daughters and a married son (one son died in Germany in 1945), 18 grandchildren and one GREAT GRANDDAUGHTER, the first to appear on our Class records. He writes: "Becky and I are hoping we can join the '21 group in Mexico next March."

The Campbells make their summer home in Lovell, Maine 04051, and are now at their winter address, 8894 112th Street North, Seminole, Fla. 33540.

Robert W. Haskel, 51 Marked Tree Road, Needham, Mass. 02192, writes: "As usual, your Class News is terrific. I may have more for you soon. Remember **Webster K. Ramsey**, Course II, who now lives at 18 Damon Street, Holden, Mass. 01520? Web now recalls he and I started 'Open House' in the M.E. Lab under Professor Miller's eagle eye. I certainly don't remember but

we did a lot for the M.E. Society. I do recall getting Steinmetz to talk at a smoker in Walker—and we hardly understood through his heavy accent. Do you remember these events? Your help will be welcomed. Web and I are arranging a date at M.I.T. to do research on them. Doris and I are well and much too busy. Regards to you and Maxine." We've told Bob to look up the bound volumes of *The Tech* in the Library and will await his results.

Class Agent and Estate Secretary Edmund G. Farrand, 5981 La Jolla Mesa Drive, La Jolla, Calif. 92037, has been firing welcomed letters at us with amazing frequency. He sent a clipping from the *La Jolla Light and Journal* which reports **Augustus B. Kinzel** retired Vice President for Research of Union Carbide Corporation and retired President of the Salk Institute for Biological Studies, has been appointed Regents Lecturer at the University of California in La Jolla, where Gus lives at 1738 Castellana Road. He will deliver six lectures, variously covering engineering, engineering education and curricula, industrial research and management, comparison and correlation of industrial and academic research. Gus is currently serving as a consultant to Lehman Brothers, Ebasco and the Kalvar Corporation.

Helen and Ray St. Laurent, made a trip to Nova Scotia to see members of Helen's family and we now have a gorgeous set of the 1968 Canadian commemorative stamps in an attractive descriptive folder. Ray's comments on Pugwash: "Dull, windy as usual and cool; but very nice to visit." His numerous letters and phone calls provide strong support for these columns and class affairs. However, we need your letters and news of your business or retirement activities, your travels and your family to maintain adequate coverage for the interest of a large segment, comprising more than half of the Class of '21 who read this news regularly.

So, please start the New Year right, with a letter to your secretaries—and don't force us to dun you personally to get it!

You and your wife are cordially invited to our Interim Reunion next March 13-15 in Mexico City; to Homecoming on the M.I.T. campus, June 8-9, 1969; and to our 50th Reunion, June 10-14, 1971. —**Carole A. Clarke**, Secretary, 608 Union Lane, Brielle, N.J. 08730; **Edwin T. Steffian**, Assistant Secretary, Steffian, Steffian & Bradley, Inc., 19 Temple Place, Boston, Mass. 02111; **Sumner Hayward**, Assistant Secretary, 224 Richards Road, Ridgewood, N.J. 07450; **Leon A. Lloyd**, Chairman, Interim Reunion Committee, 35 Spruce Street, Westerly, R.I. 02891; **Edouard N. Dube**, Co-Chairman, Interim Reunion Committee, 216 Woburn Street, Reading, Mass. 01867

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One of the great advantages of being Class Secretary is hearing from a few (too few) classmates of their experiences and perambulations. Also being able to share these experiences with other friends of long standing and put in a plug for the thrilling advantages of living in Western New York with its cool summers, long falls and invigorating winter seasons. In Buffalo in late November were eagerly awaiting our first snowfall to start the skiing season. A picture post card of the Grosslochner at 3798 meters showed a couple of small dots in the snow bank near the top of the mountain. These dots were, presumably, **Madeline and Parke Appel**. Parke wrote that they had visited Berchtesgaden and would spend October in this general area of Austria and Germany. This is a rest preceding the tremendous effort to be given to the Class of 1922 annual reunion in June as well as planning toward the Big Deal in 1972. **Horace McCurdy** has written of a pleasant summer aboard Blue Peter in Canadian waters and their plans for spending the winter at their home in Eldorado Country Club, Palm Desert, Calif. We understand that Mac will provide a TV room in the crew house adjacent to McCurdy Lounge, a generous improvement on the present facilities.

Answer to an appeal

Charles A. Chase has responded admirably to the appeal for news by

writing from Castine, Maine, as follows: "Dear Whit—I retired in 1963 after 35 years with the technical staff of the Bell Telephone Laboratories. These years included many with the Outside Plant Department, World War II as a sonar designer. After the war, I became an ocean cable engineer. This last assignment really made use of my Course XIII (Naval Arch.) background as well as my time at sea in both the Navy and the Merchant Marine. I was involved with the design of cable handling equipment for the new Bell System cable ship Long Lines. This required the development of novel gear for launching 500 lb. repeaters at 8 knots, etc. In 1957 we purchased property in Castine, Maine, with the intention of building a year-round home on this land. We began construction in 1962 and moved in to an uncompleted house in March of '63. This house is unusual in having a steel frame, a concrete slab roof and practically no wood. The walls are brick, cavity walls.

"For recreation we depend principally on our Boston Whaler, One Bell. This gives us a 35 mile radius for sightseeing and in Penobscot Bay that allows for plenty of variety. I have found no trouble whatever in passing my retirement years. As chairman of the local Planning Board and of the Inter-church Council and Training Officer of the C.C. Auxiliary Castine Flotilla. I could profitably use much more time than there is. In 1930 I married Miss Helen A. Waddell in Sao Paulo, Brazil. We have a married daughter, Annesley Swicker, living in Westfield, N.J. and four grandchildren, three boys and one girl. I do not need to say that our summers are never dull. I am sorry to have to close on a sad note. Yesterday we lost our classmate, Maurice W. Williams of Castine from a heart attack. We shall greatly miss a fine neighbor and a good friend. Sincerely, Charles A. Chase, '22." We are most grateful for this response and hope for others.

Here and there

John J. Cychol, of Paris, Ill., retired from the Illinois Division of Highways after 42 years of service. He then worked four more years as a Senior Consultant for an engineering firm in Terre Haute, Ind. He says his wife "doesn't mind having a man around the house, so

long as he doesn't come in." **Ross B. Warren** of Rio Grande City, Texas received his permanent teacher certificate in 1966 and has been giving freshman-sophomore math. He now has a three year contract to 1971 for teaching in high school. **Laurence B. Davis** has retired from Mobil Oil Corporation and has moved to the Summit Industrial Corporation where he is an officer and director. Another note about **C. Ford Blanchard** confirms his retirement from the Federal Power Commission in October 1968. **Harold O. Berry** of Taunton is still active on a semi-retired basis for Glenwood Range Company, doing engineering and quality control. Our sympathy is extended to Harold for the loss of his wife Marian last July. **Frank N. Houghton** of Elmwood retired two years ago from Arthur D. Little, Incorporated, after 40 years of service. His present activities include that of Vice President and Chairman of the Board of Investment of the East Bridgewater Savings Bank. He was a table companion of our Alumni News Editor, Miss Brenda Kelley, in October—she reports him to be in fine spirits. We would have enjoyed seeing **Robert H. Brown** of Fitchburg in academic regalia as he represented the Institute at the Convocation in observance of the 125th Anniversary of the founding of the College of the Holy Cross in October. From the specifications we now know that he wears a size 7 hat and weighs 147 pounds. We were thrilled to receive a note from **C. George Dandrow** from Chatham enclosing an August clipping from the Newark News headlining the retirement from public service of **Everett W. Vilett** of Short Hills. Ev was honored at a farewell party held at the Essex Club for his 46 years with the Newark company as well as his many civic achievements and contributions during this period. Invitations are probably out to visit Ev in the months ahead in the deep south or far west.

Your secretary was deeply disappointed to receive the calendar of Alumni Programs and find the Philadelphia group meeting was on October 15th while he was there attending another meeting. Had he known, this could have been a most pleasurable experience similar to that in San Francisco last fall. Hereafter, a call will be made as we visit various

areas to be certain not to miss an M.I.T. function. When it comes to fund raising, M.I.T. is tops. It's good to get an envelope and form with a request for a gift when all you have to do is put in your name and amount. From the various requests received by and sent out by your secretary, the best idea is to make the gifts easy to pledge. We will have a report later on the Class of '22 December dinner in Ashdown House given in honor of the Class of '22 Professor, Paul E. Gray. Parke Appel promises to convey the pertinent message "keep those cards and letters coming" for ye editor.

Among the changes of address received are: **A. H. Kidder**, Lansdowne, Pa., 19050; **H. Douglas MacDonald**, Montclair, N.J. 07042; **Frank J. Starr**, Miami Beach, Fla. 33139; **Dean K. Worcester**, New York City, 10028. A Merry Winter Season to those of you in the North and a wonderful time of relaxing and sunshine to our classmates in the sunny South and West—and abroad.—**Whitworth Ferguson**, Secretary, 333 Ellicott Street, Buffalo, N.Y. 14203; **Oscar Horovitz**, Assistant Secretary, 33 Island Street, Boston, Mass. 02119

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As we go to press for the January issue, we are frankly disappointed in the lack of personal news to report. There are over 700 active names on the roster and with most of us retired or about to be there should be much of interest to make known. We note that 47 classmates have foreign addresses and that most of these were "foreign students" with us back in the 1920's. Certainly a few lines concerning what you have done in your home countries would be of much interest to our classmates. Others have had assignments abroad as I did myself in 1960 and 1961, when I spent one-and-one-half years in England as Company Director with the British subsidiary of the Barden Corporation (bearings) of Danbury, Conn. This stay was most rewarding from many standpoints as it included much travel through European countries. There is indeed a common bond of fellowship in technology, particularly in the aircraft field that

draws Americans and Europeans together in many ways. Can we not hear from you who are resident in Far Eastern countries as well as those of you who live in other North and South American countries?

Howard Russell has told some of us about the 50th Reunion of the 141st Fighter Squadron, Army Air Corps (W.W. I) that he attended in San Diego, Calif., in late September. He and Mildred saw many fellows he had not seen since 1919. Howard was a fighter pilot in both France and Germany and a great time was had by all. He had contact at least by mail with some 150 members of this outfit. We are sure that a goodly number of our classmates of our post W.W. I class could tell us about similar occasions.

Fiesta in Mexico

On the subject of the 1969 M.I.T. Fiesta in Mexico City, this mention serves as a reminder. I have no further details to give you at this time, other than the fact that some 40 classmates have indicated interest and 33 guests, wives or others may attend also. The dates are March 13-15, 1969, and considering what has happened in previous years a most interesting series of tours and social events should result. Please refer to the 1968 Reunion Report, dated July 23, 1968, page 4, which will bring you up-to-date as far as possible now. (See: '21 paragraph 2, p. 99—Ed.)

Dave Skinner is writing to see if we can get hotel reservations for how many and we will let you know the score soon.

Class Gift

Howard Russell, our Class President reports that *Dave Skinner* has accepted the job of handling the 50th Year Class Gift. We are delighted to hear this as we are sure that Dave will do a great job again, as always.

Three classmates deceased

We are sorry to report the death of *Basil Ogden Stewart* of Biloxi, Miss., on Sept. 6, 1968. We have asked Mrs. Stewart to send us a resume of Basil's professional life for us to publish soon. More recently we have learned of the death of *Prof. Sherwood F. Brown* of Chelmsford, Mass. on August 21, 1968. Also, *Batist R.*

Hauseisen of New Augusta, Ind., passed away on September 19, 1968.

New addresses

Dean John E. Burchard, Room E-556, M.I.T., Cambridge, Mass. 02139; *Warren N. Center*, Cedar Glen Nursing Home, Danvers, Mass. 01923; *Rear Admiral Roy T. Cowdrey*, 1920 South Ocean Dr., Ft. Lauderdale, Fla. 33316; *Walter Dietz*, P.O. Box 2265, Delray Beach, Fla. 33444; *George W. Gilman*, P.O. Box 275, Rockport, Mass. 01966; *Clayton F. Harvey*, Philbrick Hill, West Springfield, N.H. 03284; *George H. Hurley*, P.O. Box 412, Fern Park, Fla. 32730; *R. P. Oven-shine*, 2111 Jefferson Davis Highway, Apt. 504, Arlington, Va. 22202; *Rev. Roy C. Sampley*, 1507-C South Street, Fort Pierce, Fla. 33450; *Orr N. Stewart*, 10514 Shaker Boulevard, Cleveland, Ohio, 44104.

This is all for this issue. Please keep the news coming!—*Thomas E. Rounds*, Secretary, 25 Ridge Road, Danbury, Conn. 06810

24

Here we go with another year. It will be a year of change, major changes on the national front. At the moment we can only hope they work out for the best. In some respects, at least, almost any change would be for the better. So what sort of changes do we have to report?

IESC Volunteers

One that comes immediately to hand is the retirement of *Howard Whitaker* from the chairmanship of the Mead Corporation. Guess they decided he was irreplaceable—in any event, there is no successor. Howard is quoted as saying: "I've tried to build the type of organization where I didn't have to do all the work. I am very proud of the backup team coming along." Which means that Mead has switched to a group vice president organization, swapping one chairman for a pride of VP's. Doesn't look as though Howard wants to take things too easy all of a sudden. He's looking into the International Executive Service Corps, so you'll probably read one day that he's teaching developing

people somewhere how to make their own pulp and then slosh it back and forth on one of those copper screens.

Guess all that rioting at Columbia last spring was too much for *Paul Cardinal*. Maybe a lot of people wondered what they would do with that \$200 million he was helping to raise if they did get it. Last summer Paul volunteered for IESC and at the moment is recruiting for them in New York. "How about lending your talents and experience to IESC for some project in exchange for tax-free travel and living?" One unexpected prospect who showed up in his office this fall was John Fitch, who has served his time in South America and is back in the USA "for good," as Paul says, but that doesn't sound quite right if he's investigating IESC. The Fitches were heading south toward Florida, looking for a choice spot in which to settle down along the way. They're heading in the wrong direction. Five years ago they were talking Cape Cod. Political note—the Fairway Association of Upper Montclair has just reelected Paul its President.

A letter from *Ru Torres* some time ago said he hoped to get in a bit of travel in South America during 1968. He was looking forward to seeing Dolph Santos in Sao Paulo, Chile, Serrano "with his wife and six daughters", and others. No word yet whether or not the trip came off, but if it did he can tell all about it next June. Ru will be at Bald Peak.

Around and about

Doug Montgomery, in California in his second year of retirement, had a varied year in 1967, an auto trip to Florida and then major surgery. However, he recovered nicely from both and is now back in the swing of things again.

We told you that *Bert Grahame* was contemplating moving from beautiful Virginia to sunny California, but couldn't make up his mind just where to go. Evidently he did at last, for a new address just arrived—San Diego.

Felix Stapleton has also moved, but here's a man who is not worried about our northern winters. "Sold my home in Bethesda, Md., in June 1967, and

on Lincoln's Birthday bought a Cape Cod type 'Snug Harbor' in Peterborough, N.H., into which Amy and I are scheduled to move June 1. Am looking forward to our 45th reunion next year." Obviously this is a note we've been holding back waiting for a lean period with little news—such as now.

Sanford Lyons must have established some kind of a record. He's been commuting for 34 years, not exceptional in itself but what a commute! It's between Arlington, Mass., and Dry Branch, Ga.

Not at all sure how this works out, but he is Vice President and Technical Director of the Georgia Kaolin Company, and at one time was (and maybe still is), President of the Vermont Kaolin Corporation. You can easily see how that might well mean a lot of time on the road, or in the air. It may be getting to him, however, for he says, "Guess I should be getting near retirement."

Nish Cornish has been drumming up business for the 21st Annual M.I.T. Fiesta in Mexico ever since the 20th ended in a blaze of glory in his garden last March. He's making a special effort this year to get the 25, 40 and 50 year classes to hold "warm-up" reunions there this spring. The Class of 1921 uses this as an excuse to hold interim reunions. This year will be their third.

Clarke Williams and **Hood Worthington** continue to sit in judgment on nuclear power plant applications for the AEC. Last spring Clarke went to Red Wing, Minn., and in July Hood got as far as Greeley, Colo. . . . You probably noticed in the *Review* last spring that this year's faculty retirements included **Mart Buerger** and **Ed Taylor**, both of them onetime stalwarts of the swimming team. Retirement, as defined by Mart: "Just means we do the same work for half pay."

"Egg Plant" forecasting technique

One of the authors of a piece entitled "Probability Approach to Electric Utility Load Forecasting" was **E. Curtis** (Egg) *Plant*, Forecasts Engineer for Public Service of New Jersey. A quick look shows that computers are in, of course, and that the authors recommend that load forecasting follow the same pattern as much of today's weather forecasting, "80 per cent chance of rain."

One promising thing, this new approach is expected to replace such currently popular ones as the "Monte Carlo Gaming Technique", favored by the T.V.A., and which sounds just the way a good many people think many of our government agencies are run—fun and games with our money. So, using the Egg Plant technique, we forecast that there is a 100% probability that everyone who treks up to our 45th at Bald Peak next June will have one whale of a time. Hope to see you there.—**Henry B. Kane**, Secretary, Box 177, Lincoln Center, Mass. 01773

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Retirements seem to be the order of the day. This is not unexpected since most of the members of the class reach the age of sixty-five during this year. Apparently **Dick Tryon** took an early retirement some three years ago and now finds that the normal retirement age has caught up with him. He has a ten-year-old boy going to school all over again for him. **Warren L. Nye** writes that he retired from Sealright Company, Inc., of Fallon, N.Y. on October 1, 1966, and is now living in Wilmington, N.C. **Winthrop R. Francis** retired from Western Union Telegraph Company on May 31, 1968. Win started working for Western Union as a messenger boy while still in high school. He continued to work with them all during his M.I.T. days, so has a record of being employed by that company for nearly half a century. **Harold Bishko** retired in August of 1968 from Corning Glass Works and indicates that he is enjoying his leisure. He recently had an exciting reunion with two old school pals—**Bernie Freudenthal**, who has just sold his business and is preparing to retire, and **Argo Landau**, '26, who is still in the harness.

Milton Salzman is still working as a Consulting Civil Engineer at Ebasco Services in New York on planning and site studies for hydro, thermal and nuclear power plants. He has probably by now retired as of October, following thirty-four years of service with the company. He hopes to maintain his professional interests and carry on consulting work on a reduced scale; however, he will perhaps be pushing a wheel chair for a while, since his wife Lillian recently had a bad fall, fracturing her shoulder and hip.

Walter J. Rhodes, Jr., reports from New London, N.H., that he retired on May 24, 1968. **Millard L. Caldwell**, after thirty-two years with Shell Development Company, Emeryville, Calif., is now retired as Patent Attorney, registered with the U.S. Patent Office. **Harry B. Smith** retired from the Niagara Mohawk Power Corporation on April 1, 1967. **Wilber E. Perkins** retired from the Manhattan Rubber Division of Raybestos Manhattan after forty-two years, on September 1, 1968. He had been Factory Manager for the past nine years, and Assistant Factory Manager for the prior nine years. He will continue to live in Nutley, N.J.

The Lamme Award presented

It should have been reported earlier that your secretary had the pleasure of seeing **Morrough (Mike) O'Brien** at the Annual Meeting of the American Society for Engineering Education in Los Angeles last June. Mike presented a paper at one of the meetings and was honored by the Society with The Lamme Award, an award presented annually to a distinguished engineering educator. The citation in Mike's case read as follows:

"To **Morrough Parker O'Brien**, engineer, teacher, administrator, for his distinguished contributions to the science and practice of engineering; for his insight and leadership in the development of new fields of professional engineering education; for his wisdom in recognizing and identifying the needs for research in socio-technologic problem areas and for pioneering the basic concept and mode of operation so effectively utilized today in many state and federal research activities; for his devoted public service as consultant to government agencies, educational institutions, and philanthropic foundations; and for his dedication to and influence in raising the standards of engineering education throughout the United States, we present this forty-first Lamme Award."

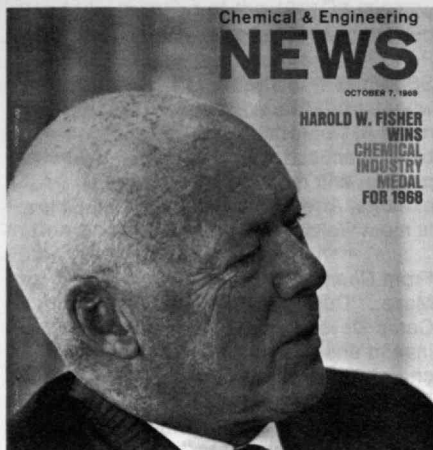
Another class member was honored on November 7, 1968 by the General Insurance Division in behalf of the Federation of Jewish Philanthropies. **Henry N. Sachs** for the past fifteen years has been the leading Board Member of the Educational Alliance and other important Federation councils and committees. The Federation of Jewish Philanthropies of New York supports 130 agencies that serve the total as well as the Jewish Community of greater New York. It would appear to be the single largest organization of its kind in the world, last year raising \$23,500,000, all of which was spent locally. I am sure every member of the Class salutes Henry for the work he has done in connection with the Federation.

It was my pleasure at a recent meeting in connection with my duties as Vice President of the American Society for Engineering Education to meet **Tom Killian** who is an active member of the Annual Meeting Program Committee. A recent letter from **Temple Patton** indicated two publications of which he is the author; namely, *Paint Flow and Pigment Dispersion* and *Alkyd Resin Technology*. He also sent along a paperback which many of you may be interested in obtaining. It is titled *Card Tricks Anyone Can DO; A Mathematical Approach*. He is now working as Editor for a three volume series which will probably be titled *Pigment Handbook*. He expects this to keep him busy when he retires in 1969 as Technical Advisor to one of the subsidiaries of the National Lead Company.

Word has just been received of the death of **Hervey S. Gardner** at Gilmanton, N.H. on January 17, 1968.—**F. L. Foster**, Secretary, Room 4-144, M.I.T., Cambridge, Mass. 02139

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Having acquired quite a few readers from classes other than '26 we can only assume that keeping you up to date on what goes on at Pigeon Cove has become a command. Yesterday we had a letter from a friend who graduated twenty years before us, **James L. Wick**,



Class of '27 award winners Nathan Cohn (left) and Harold W. Fisher (far left).

Jr., '06. He had read about the local fleet of Herreshoff "Bullseyes" in our notes and went on to say that one of his good friends, C. S. Robinson, '84 "used to tell me about those Herreshoff keel boats that he and his brother sailed at Marion on Buzzards Bay and which won many races for him." Thankfully, my boat is hauled out and tucked away under cover for the winter because we have just had a series of three severe nor'east storms.

Pigeon Cove

The other evening after driving the 42 miles home (and if you will look at the map Pigeon Cove is due northeast of Boston) I found it was really howling at our place. The only problem was a 6 by 8 foot section of screen on the porch that was held by five door bolts that had jarred loose in the wind. Trying to put it back was like attempting to hold a sheet of plywood against gusts up to 60 m.p.h. We swung it around and nailed it to the house until the wind subsided next morning. It was satisfying to be without leaks in that kind of driving rain. The engineers who designed our sliding glass doors deserve a medal.

After finishing these notes we have another problem project. Our skiff is still on the mooring in Pigeon Cove Harbor but it is full of water and there are a couple of lobster pot lines wrapped around it. The skiff is one that I purchased from *Jim Drain's* sister when she moved to California last year. That brings us to a letter we just received from *Bill Sessions* of Cleveland. "Dear George: Enclosed you will find a reprint of Jim Drain's speech at a meeting of The Newcomen Society in Pittsburgh a couple of years ago. Perhaps you would like to have this in the class archives. I think that I should say that this was by far the best Newcomen speech I have ever heard and it was better when Jim delivered it than it appears in print because he departed from his prepared text quite frequently. Yours sincerely, Bill."

The address dealt with the history of the Joy Manufacturing Company of which Jim is President. Your secretary has not had the opportunity to read the speech but it looks most interesting

since it covers the story of a company that arrived at its present size by following a pattern of acquiring and developing "machines which change the way the world works." These quotes were in the speech and presumably are a Joy motto. Recently due to acquisitions Joy is in many new fields but basically they still appear to be manufacturers of automated mining equipment. Bill Sessions sent us another communication this month and in the same mail Leon Zaitzevsky also sent us the identical clipping from the *Cleveland Plain Dealer* of October 13, 1968.

Classmate deceased

"*Duryea E. Elmendorf*, who retired in June, 1967 after 38 years with General Electric Co., died yesterday in Hanna House of University Hospital. He was 64 and lived on Cedar Road, Gates Mills. For several years prior to his retirement, Mr. Elmendorf was manager of the lamp engineering laboratory at Nela Park. Mr. Elmendorf was graduated in 1926 from Massachusetts Institute of Technology. During World War II he was on leave to the U.S. Government and received the Manhattan Project medal for his contributions toward the development of the atomic bomb. He was on the advisory council of Booth Memorial Hospital of the Salvation Army and was income tax administrator for Gates Mills. He was a member of the Chagrin Valley Hunt club. Surviving are his wife, Elizabeth; two daughters, Margaret and Mrs. James Sedlar and two grandchildren."

Bill commented in his letter: "Dear George: I had not seen 'Red' for two or three years but talked to him on the telephone occasionally. The last time was only a few weeks ago when he called to ask me about the Alumni Officers' Conference that was held in September. When I talked to him on the telephone it was evident that he was very ill. However, he was cheerful and hopeful and had retained his deep interest in the Institute. Yours sincerely, Bill."

With this issue we start a new year and we look forward to hearing from you about your activities and plans and those of other M.I.T. people too! So until February, Cheerio!—*George W. Smith*
Pigeon Cove, Mass. 01966

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Further awards have been made to *Nat Cohn* and *Bud Fisher*. These men have certainly distinguished themselves. Early in October, Bud (Hal) received the Chemical Industry Award for 1968, at the annual award dinner of the American Section of Britain's Society of Chemical Industry. He had spent five years in London beginning in 1945 as Jersey Standard's shareholders representative for the United Kingdom, where he had an important hand in all the management of the company's European operations. The award, however, was based on his entire career—to date.

Nat, Executive Vice President, research, corporate development, Leeds & Northrop Company, was awarded the Albert F. Sperry Medal by the Instrument Society of America, which cited his "distinguished pioneering and meritorious engineering achievements in the design, analysis exposition and application of automatic control of generation of power flow on interconnected power systems." We have received a copy of the speech which he made last spring when he received the "Engineer of the Year" award of the engineering societies in the Delaware Valley. He interestingly pointed out that "in the total planning sense, individual cycles must be extended beyond distribution to include disposition," defining distribution as "treatment and processing for return to a raw material or acceptable quasi-natural state."

A friend indeed

Now hear what was contained in a letter from *Chick Kane*, '24, who is well remembered for having contributed most of the art work in *Technique* and *VooDoo* during our freshman year, and for his work with the Alumni Association until his recent retirement. It seems that Chick listens pretty regularly to the Merv Griffin show, which comes on during his cocktail hour. Henry Morgan, who is on the show often, was recounting how someone gave him the name of a man to call when he was a visitor in Hong Kong. This turned out to be none other than "*We Tuh Kwauk*, an

M.I.T. graduate" and a member of 1927. We Tuh (Wally) developed into a friend indeed as Henry, so he related, had a bad cold, Wally sent his car for him and his doctor cured him promptly. At Tech, Wally was an outstanding athlete in cross-country, soccer and boxing (in which he was captain and earned his "T"). Today he is an international banker.

Erik Hofman just knocked on my door the other evening—also at cocktail time. He still lives on the island of Mallorca, Spain, and was just visiting briefly in the states. As it developed, we had a good time talking of Wally, whom Erik knows well.

Twenty years ago

What was happening per the notes of 20 years ago? *Lloyd Mac Adam* was living at Vernon, Va., and working at the Pentagon; *Bill Taggart's* daughter had just become engaged.

My thanks to *Bob Wallace* for his letter saying what class secretaries like to hear, that he reads the notes with interest. Bob is still with the Brockway Division of Mack Trucks, in Courtland, N.Y.; he says that he hopes any who come nearby will call him.—*Joseph S. Harris*, Secretary, Box 654, Masons Island, Mystic, Conn. 06355

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I present part of a letter received from *Max Parshall* late in July: "I am still remembering our 40th Reunion—it was wonderful!!

"My old roommate, *Cole A. Armstrong*, died June 2. This was a real shock. He had decided not to come to the reunion, because his wife had been very ill—then he died. Cole and I went two years to Colo. State U. (then Colo. Agri. College) and were very good friends before driving from here to Boston in a Model T Ford to go to M.I.T. Cole's father kept house for Cole, Robert (M.I.T. '30) and me while we went to M.I.T. Their mother had died shortly before they came to Ft. Collins in 1923.

"We have been having the usual busy summer. I have been doing a bit of chemistry relative to cloud nucleation—no earth shaking results—! assure you. Mary is teaching piano two days a week for the summer. We have a nice garden. We hope to get a new car this fall having used the present one for 13 years. Perhaps it will be a Ford Bronco for fishing and hunting this October." We also regretfully report that Lieutenant Colonel *Argyle C. Abbott*, Course XII, of Bloomington, Ind., passed away on July 13, 1968. His wife survived him.

Elected president

Henry Lamb, 10 Wiltshire Street, Bronxville, N.Y. 10708, sent a note bringing us up to date on his activities: "Just a note to tell you that last Monday, October 28, I was elected President of

the American Society of Safety Engineers. This organization is composed of some 9000 safety professionals. I have been connected with safety engineering in one way or another since 1931. For the past 26 years I have been working on safety standards with the American Standards Association, which has now become the U.S.A. Standards Institute. Sorry I could not join you at the 40th reunion. Better luck with the 45th."

From here and there

From closer to home we learned that *Edwin S. Kant* of Course II, and living in Melrose, Mass., recently retired. *Harold Hazen*, '24, and *Catherine (Salisbury) Hazen* of 81 Clark Street, Belmont, Mass., were off to Dhahran and Reyadh, Saudi Arabia, early in November for trustee meetings at the College of Petroleum and Minerals.

A message on the back of an Alumni Fund envelope sent in by *John F. Reynders* states that he retired in April of 1968 after 38 years with the U.S. Envelope Company. "My wife and I took a trip around the world by air immediately thereafter, visiting our younger son in Indonesia. He is in the foreign service. We plan to stay in Worcester and pursue our hobbies." And *Dexter Dimock* writes, "We had a marvelous 10,000 mile round trip in our Airstream trailer, which included the fabulous 35th reunion. The committee certainly outdid themselves." The committee certainly outdid themselves if *Dexter* was able to lose five years off his life after only three days of festivities in Cambridge.

The carbon of a letter addressed to the Technology Store in Cambridge tells us that *Arthur Elliott*, President of the Greater Winnipeg Gas Company, Manitoba, Canada, was to represent M.I.T. at the installation of Dr. Peter D. Curry as chancellor of the University of Manitoba on October 24, 1968. You might be interested to know that *Arthur* is 5' 8" tall, weighs 185 pounds and has a hat size of 7½.—*Hermon S. Swartz*, Construction Publishing Company, Inc., 27 Muzzey Street, Lexington, Mass. 02173

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This month our class notes are just that—news direct from our classmates. *Jarvis M. Hazard* of Bellerose, New York, advises he is now employed by "REF" Dynamics, A Division of Universal Oil Products, Mineola, N.Y., in their avionics section. . . . *Earl H. Abbe* writes that due to the closing of the Springfield Armory he is now retired and lives in Florida in the winter and in New Hampshire during the balance of the year. Speaking of New Hampshire, *Jackson Emery* was good enough to send a leaflet on The Libby Museum (of which he is now Director) in Wolfeboro, N.H., a natural history museum which is open daily except Mondays from the last week in June through Labor Day. There

you will find treasures: two Indian dugout canoes found in nearby Rust Pond; a large scale model of the original SS Mount Washington (a famous side-wheeler of Lake Winnepesaukee); early maps of New Hampshire and of Wolfeboro; manuscripts and historic newspapers; and many other interesting exhibits. Anyone visiting New Hampshire is most welcome to stop by.

From *Charles R. Girling* of Taunton, Mass.: "Due to M.D., diagnosed at then Camp Devens in 1929, have been an invalid unable to walk, and in wheelchair for only a few hours in any day. Pass time in part studying the Inner Belt highway system, inflation, \$ versus gold, Viet Nam war, etc." His son, *Robert K.*, graduated from Lowell Tech in 1966 and is now in management for American Optical Company in Southbridge, Mass.; and his daughter, *Dorothy F.*, graduated *magna cum laude* from Salem College in 1966, is now a student at the University of Copenhagen, Denmark. *Charles* and his wife, *Gertrude*, were wed in 1934.

First communication since 1929

We also have a note from *Richard Does* of Dedham, Mass.,—his first communication since 1929! Rather than attempting to improve upon his fine style, we quote: "It's hard to believe that, come next June, 40 years will have passed since the Class of '29 came down the steps of Symphony Hall that hot June day in 1929. Today at noon in the warming sun of a splendid Indian Summer day, I sat on the steps of the Kresge Auditorium and marveled at the stream of young men and women walking to and from their fine Student Union Building—later I spent a few moments of quiet reflection in the lovely Chapel—happy that I work nearby and can occasionally observe this vibrant, new M.I.T. and thankful I, too, was once an undergraduate. Those of you who have not been here for many years will, I believe, receive a tremendous lift upon returning.

"My life has been much occupied, as with most of us, with work and family. We have five children living—*Edwin* crashed in a Cessna 150 in Nashua, N.H., on Mother's Day 1967. *Richard* (28) married, one son, hopes to get his Ph.D. at Michigan State later this year. *Elizabeth*, married, one son, lives in Manhattan. *Jerome* is a junior at Wesleyan U. in Connecticut, *Peter* a freshman at U. of Massachusetts at Amherst and *Kathy* (11) is a sixth grader. So I figure I'll be working a while longer, God willing, before I can retire. To you of '29 who 'came out' when times were rough, warm regards and a prayer that your 'twilight' years will be as smooth and soft as a 'baby's bottom.' " Thank you, *Dick*, that certainly was worth the wait.

40th Reunion Committee

On November 4, Chairman *Baumrucker*, the *Hamiltons*, *Dinjians*, *Malmstroms*, *Meissners*, *Meads*, *Donahues*, *Farmers*, *Faheys*, *Mal Hubbard* and the *Riches*

attended a meeting of the 40th Reunion Committee all to work on details for the coming get-together at Wianno. In view of a "sit-in" at the Student Center, it was held at the Faculty Club. So, as you plan ahead for this New Year, please keep these dates in mind—June 13, 14, 15 and the expectation of a reception at President Johnson's house in Cambridge Sunday afternoon, the 15th, before Class Day. We all look forward to seeing you there.

Here's to a very Happy New Year to all the 29'ers.—*John P. Rich*, Box 503, Nashua, N.H. 03060

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At this time of year the flaps on the Alumni Fund envelopes provide a modest amount of information. From this source it appears that *Jack Bennett* is building a house on Capt. . . . Island. I couldn't find this spot on my map, but Jack says it is off the west coast of Florida. The Bennetts plan to use the new house as a vacation home until Jack retires and thereafter as a winter home. Their home base will continue to be in Hudson, Ohio. . . . *Warren Martell* is enthusiastic about "Alumni Flights Abroad" as advertised in the *Review*. He has just returned from a thirty-day trip to Asia and describes it as "Terrific! Highly Recommended." . . . *Donald McAndrew* has retired from Humble Oil and is now active in civic work. . . . *Bill Perret* represented M.I.T. at the inauguration of the president of the University of New Mexico on November 9.

For diligent readers

We have two items this month about Mother Bell's Connecticut "children": *Frank Nettleton*, who lives in Madison, has retired from his position as general plant supervisor for customer service and results, of the Southern N.E. Telephone Company. Frank is a member of the Madison Board of Education and a Vice President and Director of the First Federal Savings & Loan Association.

Dick Phillips is supervising engineer with A.T. & T. in Old Greenwich. The Phillips have two children and six grandchildren.

Alvah Perkins is Project Supervisor at the VA hospital construction program. Diligent readers of the Notes may recall that he retired from the U.S. Air Force as a colonel in 1960. His present work involves program management from initial requirements to the completed project. As hobbies he lists landscape painting, woodworking and former activity in Toastmasters International. Perk had a lung cancer operation in '64, but says that he is now well recovered with "good prospects for 'x' years to come." He has a country home in Gambrills, Md., which keeps him busy in his spare time. He would like to compare notes with fans of azaleas or daffodils, he finds the latter "particularly rewarding, just plant and forget them and they pay dividends each spring thereafter for many years."

Bob Nelson is living in Glendale, Calif., and is designing special items of office equipment—"things not available out of catalogues." The Nelsons' older son, *Bob Jr.*, graduated from the University of New Mexico and is a Lt. j.g. assigned to the nuclear propulsion program under Admiral Rickover. Daughter *Diane* is at Glendale College and son *Stephen* is a sophomore at Purdue. Bob reports having seen *Tom Wigglesworth* last summer and that they are both hoping to attend the next reunion. . . . *Mark Purcell* lives in Madison, Wisc., and is President of Siberz, Purcell & Cuthbert, Architects. The Purcell's son *Philip* is with the Chicago law firm of Isham, Lincoln & Beale. Mark is a member of the Governor's Committee on the State Capitol Building and Executive Residence in Madison, as well as Chairman of the Building Board of Appeals, a Director of the Wisconsin Chapter of the American Institute of Architects and a Trustee of the committee to preserve historic buildings in Madison. . . . Changes of address: *Granger D. Schrader*, 128 Browning Lane, Rosemont, Pa. 19010; *Thomas R. Wigglesworth*, 7676 Northfield Road, Bedford, Ohio 44146.—*Gordon K. Lister*, Secretary, 530 Fifth Avenue, New York, N.Y. 10036

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John Lawrence, Board Chairman of Dresser Industries has been appointed by President Johnson to the fifteen-member Air Quality Advisory Board to assist the Federal Government in its continuing attack on the problem of air pollution. The members of the board include representatives of State and local governments and public and private groups interested in air pollution, its prevention and control. Colonel *L. W. (Bill) Glowa* has been with the Department of Defense at Fort George G. Meade since his retirement from the Air Force in May 1963. He lives at 1383 Owen Brown Road, Ellicott City, Maryland.

From the letter box

Kenneth B. Thompson writes: "I have moved from Basic Inc. to Nevada Scheelite Division of Kennametal at Fallon, Nevada, where I am chief chemist in charge of quality control. My wife, Ruth, raises purebred Arabian horses here and I do a little ranching on the side as a hobby." *Russell W. Abbott* sends a note that he retired February 1, 1968, from Libbey-Owens Ford Glass Company, Toledo, Ohio. Russell was with the company over 26 years and held the position of Director of Structural Engineering at the time of retirement. *Carl J. H. Wahlstrom* writes: "I retired from the Humble Oil & Refining Company June 1, 1968, as a Senior Staff Engineer after 31 years of service. Six weeks prior to that my wife and I sailed on the Lurline to Hawaii where we enjoyed touring the islands, returning home May 30th. Our 30th wedding anniversary will be celebrated on a Caribbean cruise in November. Retirement has its compensations, too."

Gaynor H. Langsdorf sends a note that he is recovering from surgery for a ruptured appendix, and is thankful for the skill of his surgeon and for penicillin. *Jack Stover* writes from 1858 Old Orchard Road, Abington, Pa., that he has been a manufacturer's representative for the past 15 years, selling forgings and castings along the central part of the East Coast. He just took on a new part-time job as publisher of the magazine *Asbestos*, a trade journal founded in 1919 by his father. Jack's been married for 27 years, has two married children, and has been four times a grandfather.

Classmates deceased

C. Kenneth Jones died September 11, 1968. He moved to Duxbury, Mass., three years ago to become plant manager of Wheeler Reflector Company from Ft. Lauderdale, Fla., where he worked for Hoover Electronics. He was previously with Westinghouse at Springfield, Pittsburgh, and Baltimore.

Retired Brigadier General *John L. Person* died October 3, 1968, at Walter Reed Army Medical Center. He is survived by his wife, Beth C., of 1041 Grosvenor Place, Rockville, Md., and a son, John L., Jr., of Louisville. John was one of the West Point 2nd Lieutenants we had at M.I.T. in 1932 and subsequently served for 30 years in the Army Corps of Engineers. After retiring from the Army in 1959 he served until 1965 as Executive Vice President of the National Rivers and Harbors Congress in Washington.

Merrill C. Pendleton died on May 31, 1968; he is survived by his wife who resides at 302 North Prospect Manor, Mt. Prospect, Ill.—*Elwood W. Schafer*, Secretary, Room 13-2145, M.I.T., Cambridge, Mass. 02139; *James E. Harper*, Assistant Secretary, 2700 South Grant Street, Arlington, Va. 22202

33

Folks, the first order of business in this brand new year is to inform all of you most for the first time, of the sudden passing of *Ed Goodridge*, probably the most popular man in our class. Ed passed away on October 12th, at his long time summer home on Candlewood Lake, New Milford, Conn. Ed had come home an hour or so before dinner, and expressed a desire to take a short nap, to recuperate. Ed did not wake up from that nap, and men, girls, et al, if you ever appear to have a choice, do it this way. At the time, *Dayt Clewell* was away but, fortunately, one of Ed's sons found *Gabby Garbarino* at home. Garby called me Sunday and I called *Jim Turner* and *Dayton Clewell*, who had then returned. The family arranged a Memorial service, in New Milford, Conn., and we joined the family and a very few close friends there, *Dayton* and *Mrs. Clewell*, *Gabby Garbarino*, and I representing our Class. *George Ropes*, and one or two others visited the Chapel a day or so earlier. *Jim Turner* could not make it. Ed was not forgotten, and his

funeral service was short, simple and practically family only, according to Ed's long standing request. I think that I can safely say that we have never, at any time, had a more popular, and lovable classmate. I never have heard a person say that he did not like Ed, and I have heard literally hundreds say that they did.

As an alumnus he served on all class reunion committees; was Chairman of the 30th Reunion Committee, in fact the Committee. I do think that he took on that job himself because of our lack of leadership at the time. Very soon thereafter, Ed was elected President of the Class, and, friends, our Class was reborn right then and there. One of Ed's first acts as President was to appoint a brand new class officer, Executive Vice President, (Jim Turner). Ed stepped down as he said he would at our 35th last June and was elected Class Marshall; the first man so honored by any class so far as we know. One tribute to Ed long before his passing was given by Garby Garbarino, when he said that not only was Ed an outstanding President, but had the ability and foresight to appoint, or have elected, first rate men as officers of the Class. Your class is even now in excellent hands and will continue so, as Ed's choices are in charge, and his choices were good. Ed performed well, and leaves a real mark for us to shoot at. And, fellows, you can all say as I do, "He was my friend." Just as an aside, it is not easy to write the above. I felt no worse when I lost my Dad.

Not retired after all

I have a nice note from *George Stoll*, Treasurer, about a personal matter (I owed him some dough), and he comes through with a few of his usual terse cracks. I did mention that George is about retired, and, it appears that he fears his big Boss in N.Y.C. might read this, as he is definitely not retired. So Haw! George has been elected National Chairman of the Food Service Committee of the National Food Brokers Association, and will appear on a panel during their National Convention in N.Y.C. in December. So, "Forget about that quip on my being retired, or headquarters might forget to remit the monthly contributions, now coming in regularly."

Many thanks for the news, George. I wish I owed you money all the time if that would produce news as it did this time.

Address requests make news

Now, folks, comes the time when one finds himself feeling better. I have a short note from *Gus Martin*, who asks for a couple of addresses. Gus makes no other contribution, and he has been scolded, automatically. The nice thing is that now I know that Gus is a reader of these sharp comments (immortal?); we await Gus' reply to mine, if any. On the other hand, *G. Russell Eddy* also asked for an address and got it, such as I had, but he dictated a note to accompany the request. It appears that

Russ had fully intended to be at the 35th, but "we were in Taiwan, Formosa." He says that this kind of commuting is too long in distance. Russ' mission in Formosa was to help out Frank Pace's I.E.S.C., whose interest, in turn, was in the Chinese making knitting needles by hand for 5¢ per hour. Sounds like he shoulda been helping the Chinese. Russ says that he is leaving for Singapore in November to become, for a while, advisor to the Minister of Finance of the new Republic of Singapore; this also for I.E.S.C. Russ allows that with Britain pulling out of everything East of Suez, something must be done to make Singapore viable in metal working so that when Britain does move out of Singapore, there will still be metal fabricating left to carry on. Russ expects to visit Laconia, N.H., soon, to visit with an old prep school chum, Tom McIntyre, Junior Senator from New Hampshire. Among other things, Russ tells me that Laconia is the only place in the world where they make knitting needles. So, how about the Chinese, or is that not the world? [See: Alumni News "M.I.T. Club of Denver: 'Articulate Voters' and the SST"]

Russ intended to take in the Alumni Seminar at the Institute later, and on his way from Laconia to stop in to see us here in Exeter. Further, though I did not know it, he "will see Brother Watson dedicate the Commuter Center at Tech," all this if there were no snowstorm as there was in Syracuse the day he wrote. Allow me to insert that it really knows how to snow in that country. Many, many thanks, Russ, and we do hope to see you.

Russ enclosed a page from *Who's Who* and I am alarmed at the extent of the man's activities. Golly, whatta man! He worked for Crouse-Hinds for a time, was a superintendent of production in Syracuse during and after W.W. II, was in San Juan from 1946 to 1948 as Manager of Jewelers Products Co., was President of Caribbean Products Co., of St. Croix, Virgin Islands, from 1948 to 1956, and thence back to the U.S. where he has been President & General Manager of countless corporations in and around western New York State. Presently, Russ' card and letterhead say that he is a consultant, and, that does not mean retirement. Russ is, of course, a registered Professional Engineer, obligatory in consulting work, and is busy with outside management projects like the N.A.M. (a dirty word some places) and the American Institute of Management. He is a Mason (32nd degree) and belongs to a string of clubs, like University, Syracuse; Wyomissing, Reading, Pa.; Cavalry, Manlius; Cruzana, St. Croix, V.I.; and, men, I have skimmed over more than you see above. I submit that G. Russell is a real credit to our Class, and to his Alma Mater.

Russ, I am proud of you and I know that your story will affect others likewise. Many thanks, indeed, for your two nice notes. I do hope that you phone me before dropping in to see us! We move around some even in our old age.

Forms new society

Now comes *Cal Mohr* who has been elected Vice President of the newly formed Filtration Society which started in England and has spread to several European countries. Now there are sections in New York, Houston and Chicago. A symposium in New Orleans next March will be attended by all members including 20 from England. These English members will also visit Chicago. Ain't nature wonderful? I had a feeling that it would be harder than that to start a brand new society or professional group, but Cal made it to spare. He also intends to take in the A.I.Ch.E. meeting in New Orleans in December.

Cal heard from *Emerson Norris* about Emmy's moving out of the New York area, to Newcastle N.H. The Emerson's third daughter married a medical dental student at Harvard. The affair could not be held at Newcastle (they had just moved in) so they had it in East Hiram, Maine, their summer home. Eighty-five people attended the ceremony, held in the old barn at Hiram, including *W. Alan Andrews*. It appears that Emmy's brother Ed, '31, also made it. For once Cal missed an M.I.T. Chicago Club meeting, at which, sezze, there were probably a half dozen classmates. I'd let you have five for four because I know that crowd. Yes, Cal, I am still on John Streng's (1934) trail, via Sarasota, though my son, a local Solon, insists that there is no such animal in his backyard. Thanks for the long dissertation on *Mal* and *Eleanor Mayer*, and their most interesting trip to the Balkans; last spring was it?

Beer experts report

I had a fine letter from *Mal* and reported his comments. But this enclosure from Cal is four to five printed pages on "What's Brewing in the Balkans," a beer tome of plenty note. I cannot even try to paraphrase this stuff, so will jump around to tell a good story. *Mal* and *Eleanor* are joint experts, and both are shown as co-authors. Literally, they studied and wrote up beer in the Balkan countries from the grain and hops, to the consumer. (May I digress to say a word about *Eleanor*? She is a great grand daughter of the founder of Schwartz Laboratories. *Mal* joined that company upon graduation. News given me was that *Mal* "married the boss's daughter" though not quite literally. So, Tubby was right after all; bless his great big round heart!) These two fine reporters wrote up Yugoslavia, Bulgaria, Rumania, and Hungary, which just about covers the Balkans. I do hope that all you folks understand that *Mal* is retired, and that he is taking all these trips for pleasure, or so he says, and in the interest of science (beer science). Please do not walk off with the idea that beer making is not a scientific procedure. The Braumeister of Carling was a \$40,000 a year man 30 years ago. Please note that I have to thank *Cal Mohr* for this comment, as he passed it to me after getting it from some outsider in the business.

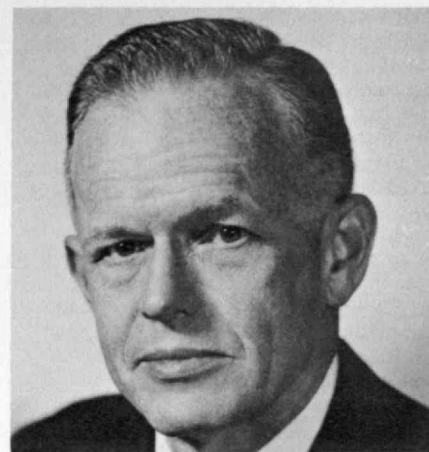
From the mail pouch

Colonel Carroll T. Newton sends a formal, and attractive announcement of his appointment as Vice President of the Swindell-Dressler Company, Public Works Division (S-D is a division of Pullman Inc.). We have already written up the good Colonel's story but I do have to remind Leona that Carroll was the guy with the hats at the 30th. Thanks for thinking of me and us, friend.

Here comes a nice long one from Frank Heselton, longer than usual if such were possible. Frank does not write every day, but he really writes when the spirit moves him. He comments, "I knew that you had many sources of class news but did not know that you operated a clipping service." Frank, I do not know just how the thing is operated, but the Institute runs the clipping service, either through a bureau or by themselves. A bureau is more thorough and more productive if enough names are involved, so, with more than 60,000 living alumni, we have names enough. No, I can't justify a bureau of my own. Haw! The stuff I had on you probably came through Detroit or through the school board's own public relations setup. Frank explains how he gets called a Course I. He is listed that way in the Corps of Engineers, though he did get a IVA in 1933; simple, no? I agree with you, Frank, that there is still a call for the IVA man. We had two architects when we designed our Florida house; one was a regular Course IV type, an artist if you will, and his good assistant was, without doubt, an architectural engineer. Frank has retired from the Government Service, to enjoy while he can, the excellent health status found by the Mayo brothers. The last daughter of the Heseltons married in May, without asking an approval, but, she would have gotten it had she asked, sez Frank. The old folks are now pleased that the girl is safely married off.

It turns out as Frank expected. Upon his retirement, the Michigan Association of School Boards have found enough work for Frank to do to keep him real busy, what with flying to Lansing or Detroit with his best girl, who retired when he did. He goes on to explain why he and his girl didn't show up at the 35th, and, it is the same old stuff about inability to be in more than one place at a time. Frank, I insist that you folks who couldn't make it were the losers. We had the best time ever, probably from being old enough to appreciate being there at all.

The Heseltons, it appears, are top friends with the Mayor who took the place of the one that they got recalled a couple of years ago. We reported on that; fire the guy that won't, and put in your friend who will, what? They went fishing with the New Mayor, and Frank says that the fishing was terrible. He caught two fish, and his license cost him \$13.50. Well, Frank, don't ever join a Duck Club, is all. Six dollars and seventy-five cents per fish is not excessive.



Ralph Hayden (above), Eugene T. Sullivan (left), and Colonel Carroll T. Newton (upper left), all of the Class of 1933.

The eldest son of the Heseltons has just finished his law studies, and has resigned from his Post Office job in Washington D.C., where he was employed as an economist. Now what the heck does the P.O. Department use an economist for? Well, anyway, they went to Washington to see their son and then returned to Sault Ste. Marie. He is now with a Detroit law firm which plans to open a Washington office. The young man must pass the bar in D.C. and then go to Michigan and do it again. He will then decide where he wants to settle. No, Frank, I have no wish to get into this speech business, and, more, I wish for no negotiations with teachers. I spent almost 10 years negotiating with the Machinists Union, so the teachers powwows should be a little drag as the ladies might not wish to use the language as found among machinists. I have one request, Frank; will you not write two pages four times per year? Then I won't have to edit your subject matter, which is so good as to make it difficult to edit. Maybe I am jesting Frank, but, keep it up, and you are my boy forever. Many thanks, indeed, for all your nice letters. Your classmates really appreciate them, even though they are reluctant to come right out and say so.

Now comes a letter that is a great pleasure to read, even if it was not written to me. It is from *Niazi I. Mostafa* (Musty to youse guys), of Cairo, Egypt. We enjoyed Musty no end at the 25th,

when the whole dang Mostafa family came to see us. Those little shavers are college graduates now. Musty writes to James E. (Jim) Harper, '32, in reply to a letter from Jim. Musty writes that he spends a lot of time in Beirut, where he has opened an office. During the last 20 years, he has operated as a contractor for mechanical and electrical work connected with water works, sewage treatment plants, and power stations, with some work in industrial plants. It seems that new regulations, and political developments in Egypt limit the scope of his work and activities. The need of an office outside of Egypt was obvious. This new office allows him to operate throughout the Middle East, with, again, some obvious restrictions.

Just to reminisce, you must remember Musty as the powerful wrestler on the M.I.T. squad when we was young, Maggie. He was a toughie, and, though I never cared too much for wrestling, we used to take in Musty's matches because he was so dang good at it, good looking, too, in a dark and handsome kind of way. Musty goes on about the family, which is, apparently, even more grown up than I thought. He has a daughter who graduated from Mills College in California, and Columbia in NYC, with a masters in anthropology from the latter; a son who finished at M.I.T. in 1963, Course XV, and is married and working in British Columbia on a construction job; another son will graduate this year, 1967, from Columbia

Polytechnic College, Pomona, Calif., from their School of Agriculture. This son will be leaving for home when he gets clear of Pomona. Well, the big man had every intention of taking in the 35th but something got in the way, and he did not. Well, Musty, the 40th is just around the corner. We are counting on you for that one. Nothing must get in the way. By then you will have retired to them mountains behind Beirut, to contemplate your sins and the wonders of nature. Say, Niazi I. Mostafa, won't you drop me a line once in a while? This 1932 fella can be a real nice guy, but he can't get you into the book; he has to send it to me. So, many thanks for writing to Jim Harper, and, Jim, if you read this, thanks to you also for sending along Musty's letter.

We have only one Alumni Fund capsule reply this time around. *Richard C. Molloy*, many years with United Aircraft, and now retired, says that he is now Technical Director of the Longyear Foundation. The name Longyear is a calculated guess, as I just can't make out much from the handwriting. I will correct this, Dick, if you will only print or type the correction. Dick, it says, is now torn between yachting in Scituate, Mass., and Pleasant Point, Maine. Gee, Dick, that ought to be easy; just yacht between the two places and avoid the "torn" condition (assuming that Pleasant Point is on the Atlantic Ocean and that you have a two masted schooner, yawl, or cutter, rigged for deep water). Son Jack Molloy is now a lawyer in Philadelphia, and may not be married. Dick did not say. His daughter is married and living in Syracuse. Dick proudly says that he should be a member of the Grandfathers Club by the time this story gets into print. Great stuff, son, and we will welcome you early inasmuch as grandfathers have little to do with the production of grandchildren. At times, Dick, there seems to be nothing superior to a grandchild, unless it might be more than one. We need more and more grandfathers, though there are folks who think that grandparents are inclined to be rather dull. Haw!

Around and about

Again our own *Robert H. (Bob) Winters* makes the news, this time by being

elected to the Board of Directors of Caterpillar Tractor Company of Peoria, Ill. This must have happened in August and we catch it in the clippings. No details are available. I do hope that the man is strong and as healthy as he looks. Otherwise he must take the responsibility of dropping out earlier than we would like. Again we find the proposed superman—one who can defy all natural laws, try to take on the work of many men and survive. Longer and longer vacations is about the only answer, and even then the mind and the heart can take just so much. Bob, we are with you, we love you, and no fooling, we want you to survive a long, long time, but more work will not guarantee that. Again, our best wishes to you and Eleanor.

Stan Walters came through and dropped in for a visit. He phoned Leona from Dover, or someplace, and made sure someone was here (this is under "I" instructions). We had a fine visit standing out in the middle of the driveway. Stan couldn't stay more than a minute, so we talked for 45 minutes. I got about froze up. I asked Stan to take his coat off to avoid over heating. He had no top coat; just a jacket, bow tie and no hat. Egad, some guys are just numb. Stan and I covered the usual stuff. For me it is the most enjoyable of all our nefarious news gathering methods but least productive of usable news. Thanks, Stan. I loved every minute of it.

Now for cream on the Irish Coffee comes Emerson (Emmy) Norris, who was a long time resident of Great Neck, L.I., and now makes his home in Paraiso (see Newcastle N.H. above). Emmy allus wus a sort of a bright guy, anyway. The *Emerson Norrises* live almost across the street, if such it is, from long time friends, the Richmond Margesons, and Mrs. Emmy has already met Mrs. Marge-son, who runs a little bitty, but top notch antique shop—mostly glassware and porcelain. How fortunate that such nice folks find themselves so close together. Again, we spent our time gossiping by the barn, though we did go take a peep at the herd, small as it is. Emmy was surprised to be able to go into a pasture already occupied by a bull. I had to explain that bulls of all beef breeds

are docile, and "clever", as we say in Maine, though at times, and when quite young, these Angus bulls can get playful (at 1900 pounds yet). Well, I can safely leave Emmy now, as he will be right handy next spring when we return to see how folks made out over the long winter. Now, men, and of course, girls, you will note that this bit of news is none too long, and, the length is surely determined by the amount of material you folks send in. I am discouraged from manufacturing news, says Brenda. Say, you fellows ought to drop in at the Alumni Office real soon, and meet Brenda Kelley, our new Alumni News Editor. I think that I will myself, now that the matter has been brought up. If she has half the stuff that her letters indicate, then I am right, so hurry into 400 Main Street.

We have a few address changes though the number is below par: *George L. Cory, Kenneth A. Devine, Morris Guralnick, William Niessen, and Leon Reisman*. That's it, folks. It appears that this is the issue that brings in the New Year. Please allow me to wish for you all a most Happy and Prosperous New Year—and—please write me oftener. Yours most sincerely—*Warren J. Henderson*, Secretary, Fort Rock Farm, Drawer H, Exeter, N.H. 03833

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Bob Eaton graduated with our class, although he really belonged to the class of 1930. But we fondly claim him as he volunteered news of himself. He's a bit older than most of our classmates. Spending most of his working life as a (T.V.) tube engineer (8 years with G.E. making camera tubes, such as Image Orthicons and Vidicons), G.E. retired him on his reaching age 65. He doesn't want to be put away for good, nor does he want to leave to chance the opportunity to meet other retired engineers. Accordingly, he has taken a job with the U.S. Army Engineers at Fort Monmouth, N.J., doing research work similar to that he has done in the past. Bob certainly has the right spirit all around; this includes his resolve to locate Russell Fanning, '30, who was his roommate and best man at his wedding!

Around and about

Donald Lister was named Vice President of the Chemical Bank New York Trust Company. He is responsible for research and planning in the personnel division. This is no small job when one considers the size of that bank as well as what one officer of another large bank once said: "much of our clerical help is just short of incompetent." It is good to know that **Walt McKay** is now a full professor of Aeronautics and Astronautics at M.I.T. That puts him way up there, pretty close to the moon these days. **Bob Moody** has bought a house in Wyckoff, N.J. within a mile of where he works. He has solved a problem most of us are still grappling with. Besides its a fine house, a bargain, and fits in with a tax requirement. He owns the Taylor Rental Center at nearby Midland Park. As might be expected, that center is beautifully clean and well organized and growing fast from a substantial beginning.

Gillette Martin has been a loyal supporter of the Alumni Fund, though he only attended Tech the first year we were there. Possibly because he left Tech, he was able to achieve the enviable position of Senior Vice President of Merrill Lynch, Pierce, Fenner and Smith. He recently retired and now lives in Morris, Conn. (mailing address is Lakeside). Now as general handman on his place he'll earn his diploma in practical home engineering with a major in maintenance.

Tim Coleman continues as President of Ocean Systems, an affiliate of UCC. This is principally a service organization, albeit an exotic one. It was Tim's company that directed the search and retrieval of the bomb lost off the coast of Spain. Much later that same retrieval submarine was lost when the cables which attached it to its mother ship snapped in a high sea. All its men, who were just near its entrance, were fortunately saved. Tim, himself, is working on a committee for ocean usage with Dr. Julius Stratton. We hope the life of this national committee will be extended.

Experiment in blackmail

Here goes an experiment in blackmail. We secretaries are so short of news that we often resort to writing particular

classmates for news. If you get such a letter and don't answer, you may be pilloried. As first offenders, and hopefully the last, we set down for public scorn these two names: *Christian E. Born* and *Colonel Carlton J. Cook*.

They can avoid further disgrace, and so can you, by dropping a line to any of us who appear below.—**James Eder**, Secretary, One Lockwood Road, Riverside, Conn.; **W. Olmstead Wright**, Secretary, 1003 Howard Street, Wheaton, Ill.; **Norman B. Krim**, Secretary, 15 Fox Lane, Newton, Mass. 02159; **George Bull**, Secretary, 4961 Allan Road, Washington, D.C. 20016

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Leo Beckwith, President of the Market Forge Company, advises that his company has been acquired by Beatrice Foods Corporation and will be operated as a wholly owned subsidiary. Leo feels this is an excellent move and helps Market Forge in their own expansion and acquisition plans. **Allen Mowatt**, Vice President and General Manager of Astrodyne, Inc., a division of Roanwell Corporation, announced an agreement between Astrodyne and Lytron, Inc., by which Astrodyne will be exclusive distributor for Lytron's complete line of compact heat exchangers and liquid heaters.

Ed Loewenstein took the Survey Course in City Planning at M.I.T. this summer. His enthusiastic letter reflects the exhilaration of looking up old classmates and living on campus again. He is currently with Loewenstein, Atkinson and Wilson, architects and engineers, in Greensboro, N.C. The 1968 Dartmouth Alumni Fund Appeal featured the story of Walter Stockmayer as the symbol for a legion of men who are remembered profoundly as "good teachers."

For work on the 1968 M.I.T. Alumni Fund, certificate awards were given to Class Agent, **Leo M. Beckwith**, New York Class Chairman, **Bernard H. Nelson**, and to **Bill Abramowitz** as Special Gifts Chairman in Boston. **Thomas F. Morrow** provided the leadership in Detroit.

Championship golfers

Following his recent western trip, **Allen Mowatt** wrote us: "At Denver in September, I took one afternoon off to play golf with **Sid Grazi** at his Green Gables Country Club Course. The weather was gorgeous, the course beautifully manicured and the golf was good too. Sid took me back to his home where I met Ann and the three children. Jeff is 22 and in his last year at Metropolitan State College in Denver. Terry is a pretty eighteen-year-old brunette starting her first year at Colorado State University. Michael is 11 and starting the seventh grade. Ann and Sid have sold their house and will move into a home they plan to build for themselves this fall. Sid is busy with Titan Construction Company which he started 18 years ago. They recently finished the Airport Parking Garage at Denver. Sid owns the new Holiday Inn at the airport, is happy, busy, and most important, healthy."

Incidentally, **Sid Grazi** won the Eighth Annual Class Golf Tournament with a rousing net 66 on his rugged Green Gables Course in Denver. Runner up was **Leo Beckwith** with an excellent net 69. This is Sid's second leg on the President's Cup which he won in 1963. Sid also won the Consolation flight in 1966. With his second championship, Sid joins **Ham Dow**, who won twice in a row, 1966 and 1967. Either one is now in a position to retire the cup by winning the championship again. The President's Cup was donated by **Leo Beckwith** when he was Class President in 1969.—Co-Secretaries: **Phoenix N. Dangel**, 329 Park Street, West Roxbury, Mass. 02132; **Irving S. Banquer**, 20 Gordon Road, Waban, Mass. 02168

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Bert Bennison writes that he is "enjoying the challenges of building a biology department at the Drexel Institute of Technology. We get involved also with two very lively interfaces; our Environmental Engineering and Science Program is concerned with attempts to prolong the survival of society in the face of various perversions of technology; our Biomedical Engineering and Science Program, on the other hand, melds the art of

electronics with the skills of life scientists to improve the outlook for ill people. There is rarely a dull moment." *R. B. Westgate* was formerly with Georgia Pacific, Savannah, Ga. and is now President of Companhia-Amazonas, Caixa-Postal 950, Trav. Benj. Constant 1416, Belem-Para, Brazil. *Ross Black* has completed two years of graduate study in Nuclear Engineering at C. W. Post College and was also co-author of an article on painted, low-profile switchyard structure in the May, 1968, *Transmission and Distribution* magazine. *Jim Ewell* is Vice President and Director of Proctor and Gamble Company. His oldest boy is now out of Purdue four years, married and in TV program production. His second oldest boy received his masters this past June and he is on his way to becoming a history professor. His third oldest (girl) was married this summer, having completed one year of teaching kindergarten after graduating from Otterbein College. His fourth oldest (boy) is in high school and is an expert in sport cars and girls.

Philip Short has recently become the owner of the Riverside Nursing Home, Inc., 405 River Street, Mattapan, Mass. *Willard D. Rand* is now in business for himself—Willard D. Rand, A.I.A., Architect, 57 Post Street, San Francisco, Calif. *Bob Wylie* is Manager of Commercial Engineering, Indoor and Outdoor Lighting, Sylvania Electric. His son, Allan Russell is a Captain in the U.S.A.F. His other son Scott William, is a senior at the Rhode Island School of Design.

Bob E. Benson is Vice President and Executive Assistant to the President, ITT. His assignment has recently been changed from Product Line Manager Telecommunications Expectations to Assistant Product Group Manager Consumer and Financial Services. Both his daughters are married and each has a daughter. *Austin Loomis* writes that he and Betty had a grand time at our 30th reunion and that the committee did a magnificent job, Betty, particularly, would "like to pin a rose on them" for the way they took care of the female contingent. This year has been busy one for the *Dick Young's* as both their son's, Stephen and Richard have been married. *Jack Ostrer's* son, Harry, was one of the incoming students to the Institute this year.

Between quinquennials

Dick Young sent the following report on the Fall-Get-Together. "At the 30th some of us thought we should try to get together between quinquennials. On September 20, 21, and 22 a group did just that, spending a fine weekend at Jug End in the Berkshires. Golf, tennis, swimming (in a heated pool) and dancing, plus other pleasures in the night club were the activities. The hike up the bridle path on Sunday morning gave us a real physical toning. Marge and I opened our room about four o'clock on Friday and served as the cocktail center for the weekend. The Wojtczak's and Goldsmiths finished with a visit and

swimming at the Loder's summer house at Twin Lakes, near Canaan. *Norm Birch*, whom I had bumped into at O'Hare in Chicago early in the week, sent us a box of color slides of the 25th and 30th and these, added to those I brought, gave all of us a chance to relive 1962 and 1967. Those who came were: Ruth and *Phil Dreissigacker*, Nell and *Ray Dreselley*, Elsa and *Bob Goldsmith*, Harriett and *Art Hunt*, Alice and *Jim Loder*, Joan and *Bob Rudy*, *Rolf Schneider*, June and *Walt Wojtczak*, and Marge and *Dick Young*.

"By the way—to those who were at the 30th and may not know—the beautiful main building at the Oyster Harbors Club burned down a short while after we were there. It was to have been closed to any more groups and remodeled for the members' private use but what a shame to have had that beautiful and gracious club house go that way." Sounds as if a wonderful time was had by everyone and those of us who could not attend had better start making plans for next fall.

It is with sorrow that I report the death of *Grandville R. Jones* who passed away July 19, 1968.—*Robert H. Thorson*, Secretary, 506 Riverside Avenue, Medford, Mass. 02155; Professor *Curtiss Powell*, Assistant Secretary, Room 5-325, M.I.T. Cambridge, Mass. 02142; *Jerome Salny*, Assistant Secretary, Egbert Hill, Morristown, N.J. 07960

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Names make news
If you don't write
I've got no clues
Drop me a line tonight.
Maybe it takes bait
To get news from '38
Later I'll get your obit
Why not now a news bit?

A few of you did write: *Russ Brown* says: "Recently transferred from Phoenix, Ariz., back to Arlington, Va., to assume the position of Regional Research Hydrologist, Atlantic Coast Region, of the Water Resources Division of the U.S. Geological Survey." *Harold Strauss* sent a postcard from Hawaii: "No ice-skating here. Expect to see *Robert S. Gordon* this evening. We still prefer California to live, but this is O.K. for vacation. *Phil Nickson* advised: "Have just completed 22 years with the Missile Systems Division of Raytheon Company. My son, *Steven W.*, has entered M.I.T. this fall in Course II, as a second year transfer student from Wentworth Institute." *Bernie Zuckerman* was elected Vice President, Engineering, of Campus Sweater & Sportswear Company. He has been with them for 22 years.

Bill G. Guindon, S.J., says he is quite busy in his new position as Provincial Superior of the Jesuits in New England: training men for Colleges (B.C., H.C., Fairfield University), and high schools, as well as missions in Brazil, Iraq and

Jamaica. Helping with move of Weston College School of Theology at Cambridge. *Frank Gardner* writes: "My son, Jim, a sophomore at G.W.U. Medical School, married Judy Waterbury of Irvington, N.Y. They have just presented E and me our first grandchild, Anne Elizabeth Gardner. A girl for us is a pleasant switch, because we had four boys."

A Tall Tale

I am desperate enough to accept short fiction stories—if you feel they'll be of interest to '38. PLEASE, PLEASE, PLEASE!—*Armand L. Bruneau, Jr.*, 550 Broad Street, Newark, N.J. 07102

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Elections are over and regardless of your political affiliations, may the New Year be a healthy and successful one for all of you.

From the letter box

Al Wu writes "I am serving as General Chairman for the M.I.T. Eastern Conference to be held on Long Island, March 15, 1969." *Ed Pollak* notes that he is now a Staff Member at Arthur D. Little, Inc., in Cambridge. The Secretary received word from *Dudley Follansbee*, that he is now President of McLord, which makes plastic products for decorations and also for aerospace purposes. He has four children, a daughter who graduated from Wellesley, '66; a daughter graduating from Wellesley, '68; a son at Mount Hermon, '70; and a daughter who is a freshman at the Mamaroneck, New York High School.

George Niles writes "In April, I returned from two and a half years in Europe where, for my employer, Emerson & Cuming, Inc., I initiated production in the new plant in Belgium. Later, we moved to Copenhagen, Denmark, where we supervised the erection of the largest microwave anechoic chamber, at the time, in Europe. In not so busy periods, we were active in sales, successfully completing the sale of several other microwave test chambers, including the presently largest in Europe in Danmstadt, West Germany."

Around and about

Ralph N. Thompson was elected a fellow at the Institute of Chemists in August 1968, and *Charles Fitter* also in August acquired a new position as Director of Marketing in Africa, Asia and the Middle East, in the International Market Division of Eastman Kodak. *Bob Dorsey* is Manager of Lighting Development for the General Electric Large Lamp Department at Nela Park in Cleveland. He is currently Treasurer of the Illuminating Engineering Society, Vice President of U.S. National Committee of International Commission on Illumination. He is going on a major speaking tour this spring in principle European marketing areas.

On November 1, Colonel *George Weinbrenner* assumed command of the



Four members of the Class of 1938 were photographed during a meeting of the M.I.T. Club of Hong Kong last year: (left to right) Alfred C. W. Louie, Harold H. Strauss, Yuk P. Poon, and Chung-Chee Wong. The hospitality was "in the Tech tradition," Mr. Strauss reported to the Review.

Foreign Technology Division of the Air Force Systems Command at Wright-Patterson Air Force Base, Ohio. *Norman L. Laschever* is living in Sharon, Mass., and working at RCA, Burlington as Manager of Radar Engineering. His son, Mark, who is 23, has a B.S. and M.S. from the University of Michigan and is working at Mitre. His daughter, Roberta, 21, is a senior at Vassar; a daughter, Margo, 19, is a sophomore at Barnard and his youngest, Cathy, 15, is a sophomore at Sharon High. *Charles Smith*, Sc.D. is now Professor of physics at the University of North Carolina at Chapel Hill. *Ed Harris* represented the institute at the Inauguration of the President at Washington and Lee University on October 18, 1968.

Walter Brewer is Operations Manager of the Aerospace Corporation in Los Angeles, Calif. *Roy Avery* is Managing Editor of the American Chemical Society News Service. *Herb Hollomon* was inaugurated as the eighth President of the University of Oklahoma on October 18. He was previously Assistant Secretary of Commerce. *Karl Fethers* received the Carnegie-Mellon University Alumni Association's 1968 Merit Award on October 18, for outstanding leadership in the development of research in the steel industry. After receiving his doctorate from Tech, Karl, for several years, was an assistant professor and staff member of the metals research laboratory at the Carnegie Institute of Technology. From there, in 1943, he joined his present employer, Youngstown Sheet and Tube Company, where he is now Vice President for Research and Development. *Bill Peck*, President of the M.I.T. Club of Detroit, 1967-1968, is also a member of, the M.I.T. Educational Council and is District Manager, Industrial Sales for Motorola Communications and Electronic Inc., in Minneapolis, Minn.

Our sympathies go out to *Dick Dunlap* who wrote, "I suspect this is the first note I've written for the Class News and regret that it brings the sad news of the death of my wife, Anne, on 8 August 1968. Although she had not been well for several months, we thought she was getting better, but that is not the way it was to be.

"We were married in 1946 when I was

teaching at Robert College and she at the American College for Girls, both in Istanbul. Our one Turkish offspring, John, is now a senior at the University of Rochester and our oldest daughter, Hope, is at Barnard. Pamela, Bill and Rowena are still in school here in Middletown. I am still with the U.S. Navy Underwater Weapons Station, here in Newport and am presently Associate Director for Plans and Programs."

Memorial Scholarship Fund

Another reminder that those classmates who would like to contribute to a Memorial Scholarship Fund in memory of F. Alexander Magoun of the Class of '18, should send their contributions to *Phil Stoddard*, Vice President, Operations and Personnel at Tech. This week your Secretary received, from Maggie's son, Theodore, the last of much welcomed Christmas cards, written by Professor Magoun, as well as a note that Maggie's wife, Carolyn, died on November 3, 1968, bringing to mind the poem:

He first deceased
She, for a little while,
Tried to live without him
Liked it not and died.

—*Alvin Guttag*, Secretary, Cushman, Darby & Cushman, American Security Building, 730 15th Street, N.W., Washington, D.C. 20005

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Alan W. Baum has been appointed Manager of Marketing Research for the five operating divisions of Enjay Chemical Company. He had been section head of marketing research for the Company's two chemical divisions. The new position places Alan in charge of marketing research activities for the Paramins, Plastics and Synthetic Rubber Divisions as well. Besides his bachelor of science degree in chemical engineering from M.I.T. in '41, he holds a master's degree in chemical engineering from Ohio State University, 1947. In that year he joined the Enjay research affiliate in Linden, N.J. as a research chemist. He transferred to the Enjay Paramins Division in 1956 where he was a technical service coordinator for four years, after which he transferred to the Marketing Services Department. He is a member

of the American Chemical Society and the Chemical Marketing Research Association. He lives with his wife at 440 West 24 Street, New York City.

Professor *Yeram S. Touloukian* is Director of Purdue's Thermophysical Properties Research Center (TPRC) which sponsored the Eighth Conference on Thermal Conductivity last October 7-10 at Purdue University's Memorial Center. The conference covered such topics as: Metals and Alloys at Low Temperatures, Nuclear Materials and Liquids, Reference Materials and Low Temperature Insulators, Thermal Conductivity Apparatus, Semiconductor and Thermal Diffusivity Methods, Fibers, Polymers, Ice and Soils.

Charles W. Hargens who is located in the Electrical Engineering Division of The Franklin Institute in Philadelphia, represented M.I.T. in ceremonies at St. Joseph's College on November 14, 1968.

William G. Kussmaul was awarded the Legion of Merit for his services in the Regular Army from which he retired of August 31, 1968, with the rank of Colonel of Ordnance. He is now associated with the Chamberlain Manufacturing Corporation in Burlington, N.J.

Sam Fry is presently at Boeing doing system engineering on the Aerospace Program's Burner II. He has one daughter in Tunisia with the Peace Corps, another daughter working for a master's degree at the University of Tübingen, and a set of twins just starting at the University of Washington in Seattle. Prior to his present work, Sam and his family spent a year in Munich helping West Germany develop its first scientific research satellite.

Ivor W. Collins is currently at the Ordnance Department of the General Electric Company, Pittsfield, Mass., where he is working on missile guidance systems, primarily for Polaris and Poseidon in cooperation with the M.I.T. Instrumentation Laboratory. Ivor's oldest son saved his father some money by succeeding in graduating from Exeter in only three years, and is now at Cornell. Ivor also has a daughter in the ninth grade and a son in the sixth grade. He reports that he

FIFTH ANNUAL TOUR PROGRAM—1969

This unique program of tours is offered to alumni of Harvard, Yale, Princeton and M.I.T. and their families. The tours are based on special reduced air fares which offer savings of hundreds of dollars on air travel. The tour to India, for example, is based on a special fare, available only to groups and only in conjunction with a tour, which is almost \$400 less than the regular air fare. Special rates have also been obtained from hotels and sightseeing companies. Air travel is on regularly scheduled jet flights of major airlines.

The tour program covers four areas where those who might otherwise prefer to travel independently will find it advantageous to travel with a group. The itineraries have been carefully constructed to combine the freedom of individual travel with the convenience and saving of group travel. There is an avoidance of regimentation and an emphasis on leisure time, while a comprehensive program of sightseeing ensures a visit to all major points of interest. Hotel reservations are made as much as a year and a half in advance to ensure the finest in accommodations.

THE ORIENT

30 DAYS \$1549

Mar. 22, Jun. 28, Jul. 26, Sept. 20

1969 will make the fifth consecutive year of operation for this fine tour, which offers the true highlights of the Orient at a sensible and realistic pace. Eleven days will be spent in JAPAN, divided between TOKYO, the ancient "classical" city of KYOTO, and the FUJI-HAKONE NATIONAL PARK, with excursions to NARA and NIKKO. Five days will be spent in HONG KONG and four in the fascinating city of BANGKOK. Shorter visits to SINGAPORE and the lovely island of FORMOSA complete the itinerary. Optional pre and post tour stops may be made in HONOLULU and the WEST COAST at no additional air fare.

A complete program of sightseeing will include all major points of scenic, cultural and historic interest. Features range from a tour of the canals and floating markets of Bangkok, an authentic Javanese "Rijst-tafel" in Singapore, and a launch tour of Hong Kong harbor at sunset, to a "Mongolian Barbecue" in Taipei, and a trip on the ultra-modern 125 m.p.h. express trains of Japan.

Tour dates have been chosen to coincide with outstanding seasonal attractions in Japan, such as the spring cherry blossoms, and beautiful autumn leaves, and some of the greatest annual festivals in the Far East. Total cost is \$1549 from California, \$1719 from Chicago, \$1787 from New York.*

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Including NEPAL and PERSIA

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Mar. 15, Mar. 22, Aug. 2, Oct. 4

An unusual opportunity to see the diverse and fascinating subcontinent of



India, together with the once-forbidden kingdom of Nepal and the rarely-seen splendors of ancient Persia. Here is India from the mighty Himalayas to the palm-fringed Bay of Bengal: the great seaport of BOMBAY; the magnificent cave temples of AJANTA and ELLORA, whose thousand year old frescoes are among the outstanding achievements of Indian art; MADRAS, in the south; the great industrial city of CALCUTTA; a thrilling flight into the Himalayas to KATHMANDU, capital of NEPAL, where ancient palaces and temples abound in a land still relatively untouched by modern civilization; the holy city of BENARES on the sacred River Ganges; AGRA, with not only the Taj Mahal, but many other celebrated monuments of the Moghul period such as the Agra Fort and the fabulous deserted city of Fatehpur Sikri; the walled "pink city" of JAIPUR with an elephant ride at nearby Amber Fort; the unique "lake city" of UDAIPUR, with its delicate white marble palaces; the great capital of NEW DELHI; and the fabled beauty of the VALE OF KASHMIR, surrounded by the snow-clad Himalayas. PERSIA (Iran) includes visits to PERSEPOLIS, the great royal capital of Darius and Xerxes in the 5th century B.C.; and ISHFAHAN, the fabled city of the 15th-17th century Persian Renaissance, with its palaces, gardens, bazaar, and famous tiled mosques. Outstanding accommodations include hotels that once were palaces of Maharajas and luxurious houseboats on Dal Lake in Kashmir. Total cost is \$1636 from New York.*

SOUTH AMERICA

31 DAYS \$1599

Jan. 18, Jul. 26, Oct. 18

An original itinerary which takes unusually full advantage of South America's great scenic and cultural attractions. The trip descends along the West Coast, dominated by the towering Andes and filled with the churches and mansions of 16th and 17th century Spain, and returns through the modern cities and lush scenery of the East Coast. Stops include Spanish colonial QUITO, with the nearby Indian market at AMBATO and a drive along the snow-capped peaks of "VOLCANO ALLEY"; Pizarro's great viceregal capital of LIMA; the ancient city of CUZCO and the fabulous "lost city" of MACHU PICCHU; lovely SANTIAGO in Chile; cosmopolitan BUENOS AIRES, the continent's largest city; BARILOCHE, in the beautiful ARGENTINE LAKE DISTRICT; spectacular IGUAZU FALLS (largest in the world); the sun-drenched beaches of RIO DE JANEIRO (considered by many the most beautiful city in

the world); the quaint and historic town of OURO PRETO (so revered by Brazilians that the entire town is preserved by law as a national museum); the striking contemporary architecture of BRASILIA; and PANAMA CITY with the Panama Canal, Spanish ruins, and free-port shopping. These great points of interest are complemented by an assemblage of South America's truly outstanding hotels. Total cost is \$1599 from New York.*

EAST AFRICA

22 DAYS \$1549

Jul. 14, Jul. 28, Sept. 22

A luxury "safari" to the great national parks and game reserves of Uganda, Kenya and Tanzania. These offer a unique combination of magnificent wildlife and breathtaking natural scenery: great herds of elephant in QUEEN ELIZABETH PARK, in the shadow of the fabled "Mountains of the Moon"; a launch trip on the White Nile through hippo and crocodile to the base of the thundering MURCHISON FALLS; multitudes of lion and other plains game in the famous SERENGETI PLAINS and the MASAI-MARA RESERVE; the spectacular concentration of animal life in the NGORONGORO CRATER; tree-climbing lions around the shores of LAKE MANYARA; and the AMBOSELI RESERVE, where all types of big game can be photographed against the towering backdrop of snow-clad Mt. Kilimanjaro. Air travel is used where possible, enabling longer stays within the parks. Also seen are the fascinating capital cities of KAMPALA, NAIROBI and DAR ES SALAAM, the exotic "spice island" of ZANZIBAR, and the historic MOMBASA, a beach resort on the Indian Ocean, with its colorful Arab quarter and great 16th century Portuguese fort. Tour dates have been chosen for dry seasons, when game viewing is at its best. The altitude of most areas provides an unusually stimulating climate, with bright days and crisp evenings (frequently around a campfire). Accommodations range from luxury hotels in modern cities to surprisingly comfortable lodges in the national parks (some equipped even with swimming pools). Total cost from New York is \$1549.*

*Special rates from other cities on all tours. Tour cost includes Jet Air, Deluxe Hotels, Meals, Sightseeing, Transfers, Tips and Taxes.

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has taken to trailers for summer vacations, and has so far enjoyed two wonderful four-week trips.

Ralph Landau reports that he is enjoying his exposure in the technical and business press, courtesy of Friendswood Development Corporation, a subsidiary of Standard Oil Company of New Jersey. "It is all due to the announcement of the joint venture with Atlantic Richfield", says Ralph.

Robert W. Blake reports that he spent the past year primarily in development work on the Boeing 747 airplane for Pan American. Roll-out of the first flight test vehicle was in September with the first flight scheduled for December. He expects that his next six months will include 747 development work and taking delivery of another group of 707's, the first group of 19 having already been purchased, with the last due in April, and the first 747 due in September of 1969. Bob says: "Ruth and I spent last Christmas in Martinique, to hold on to a remembrance of France. Two weeks in Maui in June."

Gaynor H. Langsdorf reports that he is on the road to recovery after being hospitalized for a ruptured appendix in which he was subjected to 12 days of intravenous feeding.

James W. Neighbours at present is Manager of the Grumman Aircraft Engineering Corporation's Plant 32 at Sag Harbor, N.Y. He reports that: "I was very pleased to have been the guest of Dr. Thomas Payne, Deputy Administrator of NASA at the Oct. 11 launch of Apollo 7 from Cape Kennedy. Later at Houston, Texas, Manned Space Center, I was privileged to observe the operations of Mission Control while Apollo 7 was in orbit—extremely interesting."

Erling Hustvedt reports that he is still with the Technical Analysis Division of the National Bureau of Standards. As a Captain, USNR, he says: "I have been working with Chief of Naval Operations Office, Systems Analysis on the Anti-submarine Force Level Study."

Career

Harry H. Wasserman was a Round Table Discussion Leader at The Robert A. Welch Foundation Conferences on Chemical Research held on November 11-13, 1968, at The Rice Hotel, Houston, Texas. The topic was Organic Synthesis. The conferences were inaugurated on chemical research by the Trustees of the Foundation with the object of stimulating and encouraging chemical research within the State of Texas. Harry, after receiving the Bachelor of Science degree from M.I.T., did graduate work at Harvard as a Buckley Scholar. From 1942 to 1945 he served as a Chemical Warfare Service Staff officer in the Air Force with assignment to Africa and the Middle East. In 1945 he returned to Harvard to work on the O.S.R.D. penicillin project, and in 1946 resumed his doctoral studies, receiving the Ph.D. in

1949. From 1948 to the present he has been on the staff at Yale University, first as Instructor, then as Assistant Professor (1951), Associate Professor (1957) and Professor (1962). From 1962 to 1965 he was Chairman of the Department of Chemistry. He was a Guggenheim Fellow (1959 to 60) at the University of California, Berkeley, a member of the N.I.H. Medicinal Chemistry Study Section (1962 to 1966), the N.S.F. Postdoctoral Fellowship Evaluation Committee (1962 to 1964), and a consultant to the N.S.F. Graduate Science Facilities Program. He has served on the Executive Committee of the Organic Division of the American Chemical Society (1965 to 1967) and as the Chairman of the Organic Division of the A.C.S. (1967 to 1968). He is a member of the Advisory Boards of the ACS Monograph Series (1964 to the present) and of *Index Chemicus*. From 1961 to the present he has served as Honorary American Editor of *Tetrahedron* and *Tetrahedron Letters*. His research interests include natural products, particularly bacterial metabolites; studies on reactive intermediates such as the alkoxyacetylenes, cyclopropanone, and benzyne; photooxygenation reactions of heterocyclic systems and investigations on the use of singlet oxygen in organic chemistry.

Mitchell J. Marcus, of 144 Bigelow Road, West Newton, Mass., has been appointed Special Gifts Chairman in the Boston area for the annual Alumni Fund campaign. Mitch is President of Production Systems, Inc., an electronic data processing firm in Waltham, Mass.—*Walter J. Kreske*, Secretary, 53 State Street, Boston, Mass.; *Everett R. Ackerson*, Assistant Secretary, 831 Cranford Avenue, Westfield, N.J.; *Michael Driscoll*, Assistant Secretary, 63 Center Street, Nantucket, Mass. 02554

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Yours truly here—the so-called Associate Secretary—completely "blew" his first venture in writing the Class Notes for the December '68 Issue. "Gomen-nasai", as they say in Japan; or—Pardon Me.

Speaking of that part of the world, November 6 I'm off on another trip to the operating area of Esso Eastern: Saigon, Singapore, Bangkok, etc. . . . therefore, these notes go to press as the rest of the family eyeballs the latest election returns rolling in from Lane Deer, Montana and other not-so-metropolitan areas! Therefore, much of what follows should be prefaced with a "we should have reported earlier that."

We should have reported earlier that:

Stanley M. Proctor was awarded a 1968 Bronze Beaver "in grateful recognition of Distinguished Service to the Alumni Association" at a dinner of the National Alumni Officers' Conference in Cambridge last September. Stan was cited especially for his leading role among alumni in the Cleveland area.

Among the officers for the 1969 Spring Joint Computer Conference, to be held in Boston next May, is Vice Chairman *John E. Ward* of the Electronic Systems Lab at M.I.T. . . . *Robert I. Mason* was elected Vice President and Director of HAVEG Industries Inc., a subsidiary of Hercules Inc. . . . *Jim McDonough*, one of three members of the Alumni Fund Board "retiring" at the end of a three-year term, helped the 1967-68 campaign to another record-breaking annual total—nearly \$2.9 million!

Harold D. Rosoff has been appointed Executive Vice President of General Brewing Company; he is responsible for all plant operations. *Charles E. Burnham* is now Director of Research and Engineering at the Draper Division of North American Rockwell Corporation.

Mauricio Obregon was in New York last summer to discuss a book he is writing on the "ancient Odeyssey of Ulysses." Dr. Obregon is reported to have said that his airbourne-scoutings indicate that Ulysses "must have gone further afield than thought." An aeronautical engineer at M.I.T., it sounds as though our classmate has "wandered off" the academic pathways a bit himself!

Skeptics lose out

When Pope Paul VI arrived in Bogotá, Colombia last August, *Virgilio Barco Vargas*, Mayor of that City, was on hand to meet the spiritual leader of Roman Catholics. The *New York Times* had this to say about Mayor Barco: "Friends of Mr. Barco are now collecting bets from skeptics who wagered after President Carlos Lleras Restrepo appointed him to his job two years ago, that he could not finish the highways, bridges, waterworks and public illumination that he promised to finish before the Pope's arrival. The Mayor is an engineer, an economic planner and a corporate executive. This city of 2.2 million needs all that in its Mayor. But it needs something more, because the task of running the city administration is probably second only to the presidency in political importance in Colombia." Virgilio got his B.S. in Course I with our Class and his doctorate in Economics at M.I.T. in 1954.

—A. J. Kelly, Jr., Associate Secretary, 34 Scudder Road, Westfield, N.J. 07090

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Robert S. Faurot, President of Western Felt Works, Chicago, Regional Chairman of the Educational Council in that city, and Chairman of the 25th Reunion Gift Committee of our class, died October 19 after a head-on collision with a loaded gravel truck on Illinois Highway 22 at an intersection just west of Deerfield. The driver of the truck had swerved into the left lane to avoid hitting a car entering the intersection, driven, according to an article in the *Chicago Tribune*, by a Deerfield man, 76, with a temporary Wisconsin permit. Bob, whose car

skidded 55 feet before the impact, was pronounced dead on arrival at the hospital. He lived at 41 Indian Hill Road, Winnetka, Illinois.

He is survived by his wife, Suzanne, two sons, Robert, Jr., 9 and Alexander, 7; a daughter, Suzanne, 4, his father, Henry Faurot, II, a sister, and a brother to whom we extend our deepest sympathy. I first learned of the tragedy from *Al Picardi*, Rockville, Md., past President of the M.I.T. Club of Chicago and a member of Bob's Reunion Gift Committee. Shortly afterward I received a note from *Lew Tyree* of Chicago advising me that he had notified Class President *John Hull*, Ivyland, Pa., and Don Severance, Executive Vice President of the Alumni Association. Lew who represented the Class at the funeral services, wrote to me, saying "This was a sudden and great loss to all."

Reunion planning

I have received no word on activity of the Reunion Gift Committee since the death of the chairman but the plans for the reunion itself, to be held June 13-16, are moving forward. At the request of Class Treasurer *Malcom Kispert*, the Reunion Committee met October 22 to set class dues and discuss projected expenses and income for the approaching reunion. Using the experience of the Class of 1943 as a guide, the committee is projecting an attendance of 420 persons consisting of 150 alumni, 130 spouses, and 140 children. Class dues of \$25 to include the planned reunion book were adopted and a schedule of charges for the reunion for a maximum of \$250 per family was proposed. Husband and wife would be charged \$175 plus \$25 for each of the first three children attending with no charge for additional children. An alumnus unaccompanied by a spouse would pay \$100 instead of \$175. It is not clear whether class dues are to be credited toward the reunion charges but this point will presumably be made clear in the five mailings which are scheduled. The second mailing, scheduled for November 30, was to include the dues notice and the questionnaire for the class book. The third mailing is to be dispatched January 18 and will include the initial list of those planning to attend.

From the letter box

Six notes were received this month from classmates using the flaps of the alumni fund envelopes. *Arthur F. Peterson, Jr.*, fraternity brother, Lake Road Star Lake, N.Y., writes, "I functioned as chief negotiator for our local school board and we worked out a two-year agreement with the teachers association. I keep finding uses for that Paul Pigors course I took." *Asuncion Rivera de Armstrong* writes that she is a "stay at home housewife, the mother of a daughter, age 22, and three sons, ages 20, 19, and 18, all in the University of Puerto Rico."

Bill Cooley of nearby Bethesda, Md., writes that he is president and board chairman of Exotech, Inc., which he

founded and which he describes as "a growing, multi-dimensional, advanced technology company, headquartered in Rockville, Maryland." *Donald H. Haliburton* writes from Tiffin, Ohio to say that he received his Master of Science degree from Boston University in 1953 and is currently director of psychiatric social service at the Sandusky Valley Guidance Center. Two of the notes are from overseas. *Han T. Liu*, director of South Textiles, Limited, writes from Hong Kong that he has been engaged in the textiles manufacturing business for 20 years. *William E. Norman* (London) writes: "After six years work on transportation and simulation models for a large oil company and for a firm of management consultants, I have at least plucked up the courage to launch out on my own as a consultant in systems analysis generally and transport models in particular, especially road trip planning by computer. The appropriate program, properly applied, should reduce the number of trucks required and save money for any truck operator." Norm would like to hear from classmates in the U.S.A.

From a press release of September 25, we learn that *Justin M. Margolskee*, Lexington, Mass., has been elected a vice president of Raytheon Company. He apparently continues as manager of the Bedford Laboratories of the company's Missile Systems Division, a post he has held since 1963 (see notes for January 1968).

Three incoming students at the Institute this year have fathers in the Class of 1944. *George E. DuBois* of Woonsocket, R.I., can point to *Jacques E. DuBois*. He can also point to his uncle, Edmund Welch, '46. *William R. Corwin* of New City, N.Y. can go further. In addition to his father, *Harry R. Corwin*, and his uncle *John D. Corwin*, '50, he can point to an older brother, *Daniel W. Corwin*, '66, already graduated. *Philip C. Lambe* can point to his father, *T. William Lambe*, Professor of Civil Engineering at the Institute.

You will recall that in the October/November issue I opened the notes stating the Professor F. Alexander Magoun, who wrote the notes for the class of 1918 for 40 years, died last July less than two months after his 50th Reunion. Those of you who turned to the Class of 1918 notes saw a letter written several years ago by *Richard J. Kulda* of our class was quoted extensively in the tribute to Professor Magoun. On November 3, Mrs. Magoun died in her sleep at the Magoun home in Jaffrey, N.H. I received word of her death on November 16 from their son, Theodore, as an announcement enclosed with a poignant Christmas card authored by Professor Magoun and intended to be sent after his death, as it was. Mrs. Magoun had been answering, at a rate of 20 to 30 a day, the more than 900 letters which were received following the death of Professor Magoun in July. I invite your attention to the comments of *Alvin Gutttag*, Secretary of the Class of 1940, in the October/

November issue. Alvin notes the establishment of a scholarship fund in memory of Professor Magoun and provides information on how to contribute. That's it for this month.—*Paul M. Robinson, Jr.*, Secretary, 7710 Jansen Drive, Springfield, Va. 22150, 703-451-8580. Assistant Secretaries, *Paul M. Heilman* and *John G. Barmby*.

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I am happy to report that I will be working as the new Secretary of the Class. The first few weeks of observation in this position reveals a surprising dearth of incoming information on the activities of the Class. You fellows are just not writing the Institute or your previous secretary to tell about yourselves. We certainly urge all classmates to please send us a short note telling us of yourselves, your families, your jobs and what you have been doing and where you have been living the past 22 years.

Reunions

It is not too early to begin thinking of the 25th reunion in 1971. I have attended three of the four five-year reunions held and it is very surprising that more of the class does go to these reunions. The last two reunions, held on Cape Cod, were particularly fine affairs. Both of the reunions were held at wonderful summer resorts and the atmosphere, weather and food were excellent. The reunion committee arranging both of these last two reunions did a grand job of organization and planning. I would like very much to urge all of you to begin making mental plans to attend the significant 25th reunion to be held in early June, 1971.

Promotions and celebrations

John S. Filbert, Jr., has recently been appointed Vice President of Operations of the Connecticut Natural Gas Company. Connecticut Natural Gas is a new utility formed by the merger of New Britain Gas Light and the Hartford Gas Company. John joined New Britain Gas in 1949. . . . *John R. MacLachlan*, S.M. Course XVI, has been with the Engineering Department of the Boeing Company since his retirement from the USN as Commander in 1959. John is working on the jumbo 747 jet program at Boeing in Seattle, Washington. . . . *Bill Brace* who holds degrees in several M.I.T. courses (XIII SB, I SB, and XII Ph.D.) was elected President of the Section of Tectonophysics of the American Geophysical Union.

Bill Phelan is employed as Analyst Engineer, Raytheon Company in Waltham, Mass. We are pleased to report Bill was married in October of last year to Miss Margery M. Russell of Hingham. Never one to waste time, Bill and Margery were expecting a child last August. . . . *Frank H. Low*, Course VIII, is Vice President of the Picker Corporation and General Manager of the Picker Nuclear Division. He is residing in Millwood, N.J. . . . Mrs. *William P.*

Stevens, Jr., (you will remember her as Betty Bunte, Course XVI) has been married to William P. Stevens, also an engineer, for almost twenty years. They have three children, a daughter of 17, a son of 15, and a second daughter 6. While we do not have their home address the postmark on the envelope shows Van Nuys, Calif. . . . *Edmund T. Welch, Jr.*, Course VIII, is now *Dr. Edmund T. Welch, Jr.*, and is Attending Anesthesiologist at the Hartford Hospital at Hartford, Conn. Ed, his wife and four children live in West Hartford.

Newly appointed Assistant Vice President of Halcon International, Inc., is *Edward J. Fradkin*, Course X. *Thomas F. Malone*, Course XIV, is the Vice President of Research, Travelers Insurance Company. Mr. Malone was singularly honored in April, 1968, when he was one of 50 men elected to membership in the National Academy of Sciences on the basis of "his distinguished and continuing efforts in original research." . . . *Marshall A. Ricker* is one of our Class in the field of education. He is Chairman of the Science, Mathematics and Engineering Department at the new two-year Cypress Community College at Cypress, Calif. Present enrollment is 3000 students but is expected to expand to 12,000 students by 1972. . . . *Jerome E. Fischler* is living in Long Beach, Calif., where he is supervisor of Advanced Cargo Systems at McDonnell-Douglas Corporation. Jerry received an M.S. in aerospace engineering, June, 1964. He and his wife have three children aged 20, 18 and 11.

From Huntington, Calif., we learn that *Andrew S. Yeiser* has been made President of General Systems Industries, Inc. . . . Please write for your fellow classmates will enjoy hearing about you. Good Luck and Good Health to you all. —*Russell K. Dostal*, 18837 Palm Circle, Cleveland, Ohio 44126

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The first snow of the year, kids homework, wrong numbers on the phone have delayed my start on this task. Now there is peace and quiet so hopefully I can relate a pretty fair number of notes that you have sent along with your annual contributions. You undoubtedly received *Dick Mooney's* letter indicating that our class gift will be the establishment of the Class of 1947 Student-Faculty Fund. This is certainly a worthwhile venture in these confused times on college campuses so let's all try to make it a success. Note that all contributions through 1972 will be for this fund.

From the letter box

Bob Creek advises that he is now Director of Planning for Union Oil and Vice President of Pure Transportation Company. He also sits on the boards of numerous pipeline companies in the U.S. and Canada. Bob resides with wife, three children, horse and other animals in Inverness, Ill. . . . *Fred Grant* advises

that he received his Ph.D. in Physics from VPI in 1967. Congratulations Fred. He also asks if this is a record—20 years between B.S. and doctorate for the Class of '47. What about it? . . . By the way, the U.S. Post Office deficit is certainly not being increased by the volume of mail lugged to the O'Donnell household from the Class of '47. Last year all at reunion promised faithfully to drop a note now or then. The then is now!

George Welti has joined Comsat Labs as Manager, Systems Analysis Laboratory. . . . *Morgan Cooper* advises that he continues responsible for, among other things, the DEN Development Laboratories which have moved into new and larger quarters in Madison, Wisconsin. His writing is no better than mine so it may be OEN Labs.

Bernard Morrell is in his 22nd year of teaching at Swarthmore College. He is now the Henry C. and J. Archer Turner professor of engineering having been professor of mechanical engineering since 1960. . . . *John Turnbull* is also in the academic field being Dean of the College of Liberal Arts (17,000 students) at the University of Minnesota since 1965. He spent the 1966-1967 year doing economics research in Europe and wrote a book published in 1967. Another author is *Bob Drye, M.D.*, who is coauthor of a recent publication on the behavior of study of egg functions.

Bob Michaud writes that he spent the last two weeks of August on campus attending a course in information technology. . . . *Don Kornreich* is now the SST program manager at Rohr Corporation. . . . *Carlton Elliott* is the Design Checker at International Equipment in Needham Heights. . . . *Freddy Ehrlich* is Manager of the Design Technology Operation of GE aircraft engine group in Lynn. He is residing in Marblehead. . . . *Bill Brett* is Vice President and Director of Knight & Gladieux, a management consulting firm in N.Y.

Hugh Flomenhoff is Director of Advanced Programs at Helio Aircraft Corporation. In this capacity he directed current programs of development of STOL aircraft and preliminary design studies of new vehicles.

Around and about

From the clipping services we find that Colonel *John McCabe* is now at the Air Force War College at Maxwell AFB. . . . *Fred Brodersen's* Chicago move is to serve as Director of Public Information at the American Veterinary Medical Association. Fred was raised on a farm in Southern Ohio and is an avid horseman showing his hunter mare in Midwestern horse shows. It is interesting to note the slant you pick up from clipping services! . . . *Walt Kisluk* is now Vice President of Alpha Wire in Elizabeth, N.J., a division of Loral Corporation. He was previously sales manager of OEM communications products for General Cable and apparently will be



Robert E. Siegfried, '47

overseeing marketing for Alpha. I had heard nothing of Walt for years but apparently he did a stint with the National Production Authority in Washington and started his career with Phelps Dodge. He is living with his wife and four children in Old Greenwich.

Willis Reals is Assistant to the Vice President of Texaco in charge of supply and distribution. Most recently he has been operating in the same corporate area in the U.K. and Ireland. I note that he was, at one time, in process engineering at the Anacortes refinery and I wonder if I met him while I was in Seattle.

Bob Siegfried has been elected President of the Badger Company a subsidiary of Raytheon. Bob received his M.S. with us and has worked since then through process engineering to Vice President of engineering before his present appointment. . . . The staff of the *Review* has been changed and a sincere effort is being made to improve the class notes. I was cornered into the job in the bar at the country club. All I had hoped to do was be present in each issue. This I have done but your criticisms, suggestions and correspondence would be most welcome and appreciated. Thanks!!—*Dick O'Donnell*, Secretary, 28516 Lincoln Road, Bay Village, Ohio 44140

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This month's mailbag had an interesting surprise. The news clipping service reports that of the incoming freshmen at M.I.T. (Class of 1972) three are the sons of our classmates. *Sidney B. Williams* (Lexington, Mass.), *Edwin S. Rich* (Lynnfield, Mass.), and *Roger Jeanty, Sr.*, (Paris, France) are the fathers of George, Edwin, Jr., and Roger, Jr. George Wayne (Newton Center, Mass.) has a son who is an upper-classman.

Henry Morgan joined Polaroid in June 1968, as Manager of Human Relations. Henry was previously President KLH Research and Development Corporation of Cambridge. A spring issue of *Tech-*

nology Review contained a thoughtful and pioneering article written by Henry about the success his company had employing and training Negro workers. Henry's community service is extensive both at home in Lincoln and at the state level in Massachusetts.

From the letter box

Tom Scanlan's first letter since graduation to the Class Secretary reports that he has been elected President of AMF Thermatool, Inc., New Rochelle, N. Y., a wholly owned subsidiary of AMF. Tom's early experience with AMF was in sales of evaporators and sea water distillers. In 1966 as new Director of Marketing for AMF Thermatool he became responsible for the sale of high speed production radio frequency welding systems and industrial robots. Tom and Peggy live in North Stamford, Conn., with their two sons. Tom has been scuba diving to hunt for wrecks. I'll invite him to join me for scuba diving in Birch Harbor, Maine next summer. Receiving a personal letter from Tom makes communication more effective. I hope more classmates will write.

Tom Cantwell wrote from Houston that his job with Mandrel Industries takes him all over the world. In September 1968 he was appointed Executive Vice President of Mandrel, and Tom continues as President of Geoscience Incorporated of Cambridge, Mass. Both companies are subsidiaries of Ampex Corporation and are engaged in geophysical exploration. Tom has been associated with Mandrel's computer processing of seismic data. . . . The notes you write on the envelope containing your Alumni Fund contribution are appreciated. **Glen G. Macon** reports that he accepted an appointment with the U.S. Navy Atlantic Undersea Test and Evaluation Center in West Palm Beach, Fla. Colonel **Charles K. Anderson**, Commander, Det. 7, 4th Weather Wing at Ent AFB, Colo., was nominated for the General Thomas D. White trophy given for an outstanding contribution to the nation's progress in aerospace during the preceding year. Colonel Anderson worked to establish a solar observing and forecasting network. **Ron Kallman** is moving to Palo Alto to establish and manage Western operations for Auerbach. Auerbach is a consulting firm which operates in the manner of an architectural firm for information systems. Phyllis, Ron, and their two sons should have moved by now. Ron, **Bill Zimmerman**, **Al Brayman**, and I lived on the second floor of Wood for two years prior to graduation.

Blake Myers is a Division Leader at the Lawrence Radiation Laboratory. In June **Nelson L. Alpert** (Stratford, Conn.) became an independent consultant in the field of instrumentation with emphasis on (but not limited to) instruments for chemical analysis, clinical diagnostic analysis, and spectroscopy. Nelson has made a good start for as he writes: "I am pleased to report I don't spend much time in Stratford." . . . **Edward J.**

Kratovil (Chicago) sent a note describing how much he enjoyed our 20th reunion. Ed is in sales with American Hospital Supply. **Bob Chandler** (Chicago) was elected a Vice President of Diversey Corporation. Bob will be responsible for the control, supervision and co-ordination of Research and Development activity in all Diversey Companies in some 20 odd countries around the world. He returned to the U.S. two years ago after living in the United Kingdom for seven years as an employee of Diversey Ltd., in London. Mae and Bob live in suburban Chicago with their daughter. Their son Robert is a sophomore at Ripon College.

Fund and Reunion Gift activities

Many of our classmates have been actively working for the Alumni Fund. Certificates of Appreciation were awarded at the October meeting of the Alumni Advisory Council in Cambridge. The recipients of the awards include **Dennis Allegretti** (Chicago) our class agent; **Bill Zimmerman** (Los Angeles) and **George Wayne** (Boston) Special Gifts Area Chairman; **F. Mansfield Young** (Boston) Special Gifts Class Chairman; **Charles W. Larkam** (Austin, Texas) Regional Chairman; and **Denny McNear** (San Francisco) member of the Alumni Fund Board.

The list of Regional Chairmen is longer: In Florida, **Manfred G. Wentzel**, Brevard County; **Peter Hand**, Orlando; **Eugene Purdum**, St. Petersburg; in Massachusetts, **H. Stanley Palmer**, Lynnfield; **Haig S. Yardumian**, Malden; **John C. Adams, Jr.**, Marblehead; **Bob Wofsey**, Newton; in Michigan, **Edwin E. Hebb, Jr.**, Dearborn; in New Jersey, **Bill Grant**, Fair Lawn; **Bill Newton**, Mountain Lakes; **Jerry A. Lott**, Westfield; in Pennsylvania, **Bill Dyll**, Lancaster; **Ben Dann**, Scranton-Wilkes Barre; in Tennessee, **E. Neil Helmers**, Nashville; in Texas, **Stuart E. Smith** (Houston); and in Virginia, **Robert T. Ellsworth, Jr.**, Alexandria. The receipts from the drive are used by M.I.T. for educational activities, principally in the area of student environment.

On October 10, 1968, **George Wayne**, 25th Reunion Gift Chairman, invited **Sonny Monosson** (Class President), **Dennis Allegretti** (Class Agent), **Ben Brettler**, **Ken Brock**, and me to a meeting to determine the objectives of the 25th Reunion Gift and to begin recruiting the men who will help obtain the gift. Also invited but unable to attend were **Bill Maley**, **Dick Harris**, and **Bob Bliss**. Despite the strain produced by the obvious problem of determining the size of our personal gifts, the meeting was extremely entertaining and at times the comedy was excellent. I wish I could capture some of George's comments about the letter that Dennis was writing to our Class to ask for their Alumni Fund contribution and to explain that beginning this year gifts to the Fund will be credited to our 25th Reunion Gift. The situation degenerated to the point that George was complaining that the rough draft which Dennis wrote on legal

size paper would not fit in George's photocopy machine. Sonny suggested someone was acting like a "sorehead." **Ben Brettler** relaxed and stretched out on a couch with his drink and the entire scene was reminiscent of a bull session in the dorms. **Ken Brock** read aloud the names of the 1600 members of our Class, and George asked the age of every coed on the list. I'll leave some of the scene to your imagination, but certainly this meeting held for the benefit of M.I.T. added some comic relief to the lives of the classmates who were present. Ken, who was present as Director of the Alumni Fund, didn't find the situation very funny. Considering the record breaking goal that George is considering for our 25th Reunion Gift, I think Ken will have his day in 1973 when George makes the presentation to M.I.T.—**Martin S. Billett**, 16 Greenwood Avenue, Barrington, R.I. 02806

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The Reunion Committee had another meeting the other night at **Stan Margolin's** house at which the following was brought up: **Paul Weamer** has done a smooth job on the questionnaire which you will be receiving. The completed anonymous responses will be digested and analyzed 29 different ways by a large computer and the results will be neatly printed up for your information and possible amazement. Stan and Roz Margolin will be in Bermuda from February 21 through March 2 during which time he will be polishing details.

Our reunion will offer numerous contests in the fields of golf, tennis, motorbiking, sailing, pedalboating, etc. The Bermuda Trade Development Board (TDB) is giving photo coverage to appear in *The Royal Gazette*. Buy one on the newsstand while you are there. Here are some of the folks who will be there: **Bob** and **Dagmar Hamman** with **Allegra** (12) and **Sabrina** (3); **Jack** and **Evelyn Barriger**; **Andy Bigus**; **Donal** and **Jacquelyn Botway** with **Denise** (13) and **Susan** (11); **Alex** and **Brit Darbeloff**; **Ira** and **Betty Dyer**; **Sidney** and **Aileen Howell**; **Malcolm** and **Doris Kurth**; **Harry Lang**; **Stan** and **Roslyn Margolin**; **John** and **Munya Miller** with **Lisa** (10) and **John Jr.** (8); **Paul** and **Jacqueline Ostergaard**; **Joe** and **Eunice Schneider**; **Ed** and **Vera Somma** with **Patricia** (10); **Charles** and **Jeanne Sutherland**; **Ivor** and **Anne Thomas** with **Nancy** (18) and **Thomas** (16); **Bob Walton**; **Paul** and **Virginia Weamer**; **Kemon** and **Rhoda Taschioglou**; **Harry** and **Jean Lambe**; **George** and **Peggy McQueen**; **Jim** and **Peggy Berman** with **Chris** (14) and **Andy** (11½); and **Tom** and **Mary Toohy**.

Outrageous?

Kurt W. Back who received his Ph.D. in economics with our Class is involved in a controversy in which I think it is impossible to be neutral. Dr. Back is a professor in the sociology department at Duke University in Durham, N.C. Quite appropriately, he is a Council Member



J. Yamron, '49

A. W. Collins, '49

in The Society for the Psychological Study of Social Issues. One of these issues is rioting. This year's Appropriations Act for the Federal Labor, Health, Education and Welfare Departments prohibits payments or assistance in any form to convicted rioters. Sounds fair enough, doesn't it? Emphatically no, says Dr. Back. It is the position of his group that such discrimination is unacceptable because it would rule out much research on the inner city and experimentation with rehabilitation efforts. They feel that such rules will impede vital social science efforts useful and necessary for the implementation of justice and law.

Pay for rioters? At first hearing, the proposition sounds outrageous. But Dr. Back's position is hard to dismiss.

From near and far

Alan W. Collins, whom I last saw fourteen and one-half years ago at our fifth reunion, has been appointed Manager of Management Information Systems for The Singer Company. Alan was previously with Grumman Aircraft in a similar capacity. Prior to that, he was a management consultant in Copenhagen, Denmark. Earlier, he worked for the Aluminum Company of America as senior staff industrial engineer and systems analyst. He and his wife, the former Constance Ann White of Port Washington, N.Y., live in Stony Brook, N.Y., with their three children.

Maurice F. Parkins writes that he has just celebrated the 10th Anniversary of the opening of his firm Parkins, Rogers & Associates, Inc., planning and urban renewal consultants, by moving into the Book Building in downtown Detroit. His firm serves more than 75 cities and towns in the United States by providing comprehensive planning and urban development studies and programs. A regional office was set up in Columbus, Ohio, two years ago. **Albert A. Livingston** lives in suburban Sherman Oaks, Calif., (in the San Fernando Valley) with his wife, Marjorie, and children Sharon (16) and Steven (12). Albert is active in estate planning and associated work in insurance for the past 12 years. He holds ratings of M.D.R.T. and C.L.U. **Burt Mendlin** is production manager for the Longview (Washington) Fiber Company which makes boxes and bags. The Mendlins have four children: Jeff (16), Martha (15), Jill (13), and Meg (4). All are active skiers and campers and enjoy the great Pacific Northwest.

Norman W. Llewellyn lives in Slingerlands, N.Y., and is assistant to the Vice President of The Lane Construction Corporation in Meriden, Conn. He is active in highway and heavy construction work and expects to move to the Hartford, Conn., area this summer. **Louis B. Kuhnle** writes cryptically that he has been transferred to the home office in Charlotte, N.C., and is a senior engineer in the heavy construction department. **Herb Spivack** is President of the M.I.T. Club of Rhode Island for 1968-1969. Herb, as I wrote in some detail a while back, is President of Metachem Resins Corporation in Cranston, R.I.

Dave Hardin addressed the European Market Research Society Congress in Opatija, Yugoslavia, last September and has been elected National Vice President of the American Marketing Association.

Jack Barriger has returned! After 18 years in the southwest with the Santa Fe Railroad, he has joined Sylvania here in the east to head up a group working on automatic railroad car identification using an electro-optical computer input device for reading labels on railroad cars.

Nate Sokal is president of Design Automation, Inc., in Lexington, Mass. He applies computers to the design of circuits and systems in electronics.

Charlie Sutherland has moved to Weston from Wellesley, Mass., in an effort "to get a little more elbow room." Room to do what with your elbow, Charlie? He, his wife Jeanne, and their four daughters, Laura, Ellen, Christy, and Carol are delighted with their new home. Charlie recently (August) completed his 10th year with the R. H. Sturdy Company, the last 5 as President.

James H. Burrows is Technical Director, Information Systems Division, at The MITRE Corporation in Bedford, Mass. MITRE is an independent, systems engineering corporation formed in 1958 to provide technical advice to such Government agencies as the Air Force Systems Command and the Department of Defense. It also works for the Department of Commerce, the Department of Transportation, and NASA.

Robert M. White, who received his Sc.D. degree in meteorology with us, spoke awhile back before the Joint Conference of the American Meteorological Society and the Society of American Foresters. He was discussing the disastrous fires which wreaked such havoc in the western woodlands the year before. Among many things he said: "As you will recall, we had an above normal precipitation regime in the spring and early summer, last season in the West. This resulted in a heavy growth of ground cover and set the stage that provided extensive fuels for easy starts of fires and for their rapid movement into the timberland. We were confronted with an extremely dry summer. In some areas there were as many as 90 days without rain, setting new precipitation

deficiency records and resulting in a drying out of the fuels. There were literally thousands of fires, many of them caused by lightning, which culminated in a historic four-week period from mid-August (1967) that truly tested the strength and flexibility of the fire control organizations and their supporting fire-weather service." As you can see, Dr. White is an interesting speaker. He is the Administrator for the Environmental Science Service Administration in Rockville, Maryland.

Writing in the same issue of the *Bulletin of the American Meteorological Society* in which Dr. White's speech was reported, **William K. Widger, Jr.**, clears up some confusion in scientific circles with "A Note on the Wien Displacement Law" in which he points out, quite rigorously, that, when deriving the Law in terms of wavelength as compared to wavenumber, the spectral points of maximum flux are not equivalent.

The Prudential Insurance Company has announced the promotion of **J. Arthur Matey** to Director of Management Information and Systems in the ordinary agencies department. I knew John Matey very well in school and am delighted to hear the good news of a promotion. John lived across the hall from me on the fifth floor of Runkle Hall (the penthouse) and I miss the fine discussions we used to have. John has been with Prudential ever since graduation and holds a Chartered Life Underwriter's designation awarded by the American College of Life Underwriters.

Dave Eberly has been appointed Vice President and General Manager of Warwick Electronics Incorporated's Audio Products and Components Division. The new division will consolidate the company's operations in stereo consoles, phonographs, radios, and magnetic tape products. Two company subsidiaries, Mid-West Cabinet Corporation, and Saginaw Furniture Shops, Inc., will be included in the new division, as well as Warwick's manufacturing operations in Covington, Tenn., and Niles, and Zion, Ill. Warwick is based in Chicago.

Joseph Yamron has been appointed General Manager of Sanders Associates, Incorporated in Bedford, Mass. Formerly a member of the corporate staff at United Aircraft Corporation, East Hartford, Conn., Mr. Yamron will be responsible for all phases of research, development, manufacturing and marketing at the division which employs approximately 1,300 persons. The division is engaged in production of the Forward Area Alerting Radar, RASCORE electronic target scoring systems, and many other major military development and production programs. Mr. Yamron holds six patents and has written numerous technical articles. **Thomas J. Lamphier** has been selected as one of approximately 162 business executives and government officials to participate in the 54th session of the Advanced Management Program conducted by the Harvard University

Graduate School of Business Administration. Each man is sponsored by his company or agency, in the United States or abroad, for the thirteen-week course designed to prepare executives in or approaching top management positions, to exercise full leadership responsibility in an age of unprecedented change and challenge. The 54th session extended from September 8 through December 6, 1968.

Theodore C. Hossfeld is president of Insurance Investors Fund, Incorporated, based in San Francisco. Recently he received rather flattering publicity in the business pages of the San Francisco *Chronicle* for topping the performance list of mutual funds for the first six months of 1968. Ted's company posted a 34.5 per cent improvement in net assets per share during the period.—**Fletcher Eaton**, Secretary, 42 Perry Drive, Needham, Mass. 02192

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Nick Badami is President and owner of the Ritangela Construction Company. He and wife Rita have three daughters: Angela, Carla and Patrice, and one son, Nick. Nick, Sr., is the prime contractor on the construction of the Sullivan County Municipal Airport in Monticello, N.Y. . . . **Leroy Blumberg** is affiliated with the Brookhaven National Laboratory. He and Sydel have three daughters: Many, 9, Deborah, 7, and Julia, 6. . . . **W. Scott Connor** and wife Katherine live in Toledo, Ohio, with their children Craig, 14, Leigh Ann, 13, and Gary, 9. Scott is an insurance consultant. . . . **Fred Fead** was married on June 9, 1967 to Marilyn Mull, in Denver, Colo. Fred is an IBM Systems Engineer. . . . **Joseph Hadad** is with Raytheon in Andover, Mass. He enjoys playing golf, bridge and the stock market (after work).

Edward Handy is an associate of the firm of Barton-Aschman Associates of Chicago. The firm offers consulting in transportation and planning. He and Margaret have one child, a daughter aged 13. . . . **Parker** and **Joyce Hirtle** have two sons: John, 11, and Timothy, 6, and they all live in Lexington, Mass. Parker is an acoustical consultant for Bolt, Beranek, and Newman in Cambridge, Mass. . . . **Dorothy Ladd**, SM IV, heads the M.I.T. Instrumentation Laboratory's technical publications group. She lives in Manchester, Mass., with her husband, Roger, who is a project engineer for Analex Corporation of Boston. . . . **Charles Lenz** is a professor of Electrical Engineering at the University at Hawaii in Honolulu. Charlie is still a bachelor and thus able to more fully appreciate the beauties of Hawaii.

Kenneth and **Dorothy McCorkle** live in Powell, Tenn., with daughters Rebecca, 13, Dorothy Lynn, 11, and Margaret, 9. Ken is still with Oak Ridge National Laboratory. He received his Ph.D. in June of 1966 stealing the honors (for latest Ph.D.) from John Morganthaler,

who is currently Director of Advanced Technology/Research for Bell Aero-systems in Niagara Falls N.Y. The Morganthalers have three children and live in Lewiston, N.Y. . . . **Donald Parrish** is Principal Engineer for Aero Tech Consultants in Evendale, Ohio. He and Estela is supervisor of anesthetists at Bethesda Hospital.

Stuart Pratt, Jr., SM X, lives near the shore of Lake Michigan. He works in production supervision at DuPont's neoprene synthetic rubber plant near Montague, Mich. The Pratts have two daughters. . . . **Wilfred Scull**, also SM X, is Project Manager, Orbiting Geophysical Observatories, for NASA, Goddard Space Flight Center in Greenbelt Maryland. . . . **Charles Stokes**, SM XIV, his wife Anne and their two children (Kevin 18, and Keith 16) live in Stepney, Conn. He is the Charles Anderson Dana Professor of Economics, a newspaper columnist, author of four technical books, a consultant, trustee, director, "and very tired." . . . **Richard Strauss**, formerly Executive Vice President of National Polychemicals, Inc., opened a consulting practice in product and process development. He and Ginny have two girls: Judy 10 and Ellen 8, and one boy; Jonathan 6. They live in Lexington, Mass.

Robert P. Webb, SM X, works for Chevron Research Company in San Francisco. The female Webbs outnumber Bob three to one with wife, Joyce, Patricia 7 and Nancy 1. . . . **Robert Wedan** has been appointed Chief of the Guidance Laboratory at NASA Electronics Research Center in Cambridge, Mass. He joined NASA in June of 1966 after 13 years with Honeywell. The Wedans have three children and live in Lynfield, Mass. . . . **Tracy Wichmann** writes: "I am now employed by Teledyne Systems Company of Northridge, California. I work for the Vice President and Director of Advanced Systems, which means that I run proposed efforts and study programs on large electronic systems that involve more than one Teledyne division. My present boss hired me into Litton 10 years ago where we did the same thing. I still live in Sherman Oaks with my wife Rita and our 6 year old Blonde: Amy." Our wishes to all of you for a happy and prosperous New Year—**Walter O. Davis**, Assistant Secretary, 346 Forest Avenue, Brockton, Mass. 02401; **Howard L. Livingston**, Secretary, 358 Emerson Road, Lexington, Mass. 02173; Assistant Secretaries: **Paul G. Smith**, 11 Old Farm Road, North Caldwell, N.J. 07006; **Marshall Alper**, 1130 Coronet Avenue, Pasadena, Calif. 91107

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There is a good backlog of news beginning with Captain **William Ferguson, Jr.**, who has been in Vietnam since September, 1967, presently managing Qui Nhon Army Airfield, and who plans to retire from the service and return to civilian life in 1969. **Dick Baker, III** is still with the Bartelt Engineering Company, now



F. B. Fairbanks, Jr., '52



R. E. Lyle, '52



N. Levine, '52

Assistant to the President having started there directly upon leaving M.I.T. Wonder how many others are still with the first company? Dick, Sally, and three sons spend their winter vacations skiing in the Rockies.

Quickies

Chuck Springer is Manager of Engineering at Althaus Chemical Division of Crompton and Knowles in Reading, Pa. **Severo V. Amagna** is presently Assistant General Manager of Refining for Caltex in the Philippines. **Herbert P. Kagen** is now Chairman Department of Chemistry at West Virginia State College in Institute, West Virginia. **Clifford H. Morse, Jr.**, is still an Associate in the Architects Collaborative in Cambridge and is working on an IBM laboratory near Washington, and consulting on design for a new airport in Kansas City. The Morses have bought M.I.T. Solar House No. 4 in Lexington, now de-solarized, however. **James S. Stolley** is now a Vice President of Manufacturing at Hammernill Paper Co., and enjoys family skiing and sailing in the Erie area with wife Maggie, and Karen, Jim, and Beth. **William Barry** is now retired from the Navy (Cdr.) and is with Systems Research Corporation in Washington.

Philip E. Sperling has been working for Coats & Clark in R & D since leaving the service after M.I.T., and has progressively moved from Project Engineer, to Assistant Director of Physical Research, to Director of Physical Research, to Director of Research, with a brand new R & D facility in Union, New Jersey. Phil is an Educational Counselor and a Regional Fund Chairman. **Alan G. Geisler** is President of Technical Oil Products, Inc., and for a hobby plays the bagpipes in the Fairleigh Dickinson Pipe-Band down there in New Jersey. **Gustave J. Rath**, a Professor of Industrial Engineering and Management Sciences at Northwestern, has been selected to direct

the Design and Development Center established there, which will work in such areas as urban system design, world food problems, underwater factories, and computer-assisted design techniques. The center will accept selected problems for study as topics for master's or doctor's theses from industrial concerns and government agencies.

Doug Haven reports he is enjoying the financial world with Hogan, Ashford, and Company in Boston, financial planners and investment counselors. *Cliff Herdman* writes from Red Bank, N.J., that he is still with the Port of New York Authority where he has been since M.I.T. and is at present Manager of the Visual Communications Division at the Authority, handling all promotional and industrial photography, architectural models, and exhibits, etc. Incidentally *George R. Roy* is also there as Special Assistant to the Director of Marine Terminals.

Commander *Charles J. Mathews* has assumed command of the U.S. Naval Mobile Construction Battalion 58, homeported at Davisville, R.I. They currently deployed in Vietnam where they have been building an 8,000 man combat base for the Marines. This is the largest single undertaking by one Seabee battalion in Vietnam to date. *Richard E. Lyle* is currently Senior Research Associate, Marketing Service Division, Lubricants, at the Richmond California Laboratory of Chevron Research Company (Standard Oil Company of California). Dick and family live in El Cerrito and he is active in the American Chemical Society, the Chemical Society, London, and the Society of Automotive Engineers.

Frank B. Fairbanks was named President of Horix Manufacturing Company, Pittsburgh; they manufacture bottling and processing equipment for the food, drug, and household products industries. *Charles A. Stoddard*, champion sports car driver, has built his foreign car dealership into quite a large business in Cleveland (Porsche, Mercedes, Volvo, and Fiat), working from a single franchise to a quarter of a million dealership. *Nathan Levine* of Parsippany, N.J., has been promoted to Assistant Director of the CAMAR System Lab at Bell Telephone Labs, where he will have systems engineering responsibility for the phased array radar project. Nat holds and M.S. and Ph.D. degrees in physics from the University of Illinois, as well as his M.I.T. B.S. And with that, we'll close this column. Keep the letters coming, they are much appreciated.—*Dana M. Ferguson*, Secretary, Box 233, Acton, Mass. 01720

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Marvin Caplan who is "presently an Eastern Regional Manager for a leading electronics company" reports that he is happily married with three children and has been living in Concord, Mass., for 10 years. *Marshall Nelson Daniels* has been appointed Associate

Professor of Clinical Pathology at the New York University School of Medicine. *Alex Dreyfoos*, wife Joan, and children Robbie, 10, and Cathy, 12, are moving to a new home in West Palm Beach, Fla. (257 Tradewind Drive). He would welcome seeing old and new friends and promises all a swim in the ocean. The relocation is in conjunction with an expansion (and relocation from Connecticut) of Photo Electronics Corporation, of which Alex is President. PEC's main product is the Video Color Negative Analyzer, a solid state electronic instrument that instantly displays an adjustable color picture of a color negative and provides information for making photographic prints that match the displayed picture.

Around and about

Aaron A. Galvin has left M.I.T.'s Lincoln Laboratory which he joined at graduation and is now Vice President, Advanced Development at Aerospace Research, Inc., in Brighton, Mass. He lives in Lexington with wife Frayda and three children. Major *John Giancola* completed his Ph.D. in Metallurgy in January 1968. His new address is 6934 Post Avenue, Edwards, Calif. Keith Hertz, '55, and *Dave Wiesen* are partners in a Newark electronics manufacturing firm which recently supplied a loudspeaker for use in the Apollo space program. Aside from business, Keith spends considerable time sailing and is active in the U.S. Power Squadrons having achieved the rank of Junior Navigator to date. Dave's winter activities will be restricted to local skiing as a result of wife Muriel's pregnancy. Baby is due in March.

Ernest Hinck was recently promoted to manager of development, portable compressors, Ingersoll-Rand Company in New York City. Ernest received an M.S. in mechanical engineering from M.I.T. in 1959 and proudly reports a daughter, Audrey, 9, and son, Taylor, 6. *H. J. Maier* attended the 16th Program for Management Development at Harvard's Graduate Business School. *J. Reed Margulis* is very much involved in the growth of Apogee Chemical, Inc., in Richmond, Calif., manufacturers of speciality chemicals for the plastics and electronics industries. As Vice President, Marketing, he has traveled throughout the U.S.A., Canada, England, and Israel.

Better luck next time!

Hugh Nutley lost a bid for State Representative in Washington state where he is Assistant Professor of Physics at Seattle Pacific College. The political flyer which he sent shows Hugh, wife Frid Eileen, and children Lynne, Daniel, Erik, Sonja, Paul, and Bryon and indicates that besides politics, he is active in many organizations including the Tacoma Swim Club, Kiwanis, American Physical Society, and his local church.

Jerry Perry, wife Brenda, and children Merry Lynn, 12, Rigdon, 9, and Dawn, 9, are building a new home in Richardson, Texas. Jerry is a Specialist at

LTV in Garland, Texas and is looking forward to our 15th class reunion. *Anthony Romano*, while continuing his Real Estate Development activities in Springfield, Mass., has purchased the old Browne and Sharpe properties in Providence, R.I., and is looking at several other New England cities for promising downtown real estate development projects.

My old buddy *Charlie Smith* writes to say that he and wife Pat have just moved to 93 Cobblestone Drive, Paoli, Pa. His transfer results from the Pennsylvania-New York Central merger. Charlie has been with New York Central since he got out of the Army in 1957. *Frederick West* is doing research on spectroscopy of double stars and the flattening of the planet Uranus. He planned to visit Kilt Peak Arizona at the end of November as a guest observer to obtain more spectra of double stars.—*E. David Howes, Jr.*, Secretary, Box 66, Carlisle, Mass. 01741

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It seems hard to believe that the 1970's are just around the corner, especially when writing about associations we all made in the early '50's. Let's all wish for a happy, successful and peaceful 1969. I look forward to a better life in the 1970's as well as our forthcoming 15th reunion.

Dave Rados was married to Margaret Ann Scanlon of Fairfield, Conn., in September. Dave has his Ph.D. from Stanford and is now on the faculty at Columbia's Graduate Business School in New York City. I am sure they will be pleased to hear from friends at their home at 185 West End Avenue. *Peter Toohy* wrote from a delightful sounding place called Basking Ridge, New Jersey telling of his promotion to Plant Manager at Shell Chemicals Synthetic Rubber and Plastic Plant at Marietta, Ohio. Pete expected to move the family in October and is probably well settled by this time.

A presidential candidate

We now relate the story of the man who may be the first M.I.T. graduate to run for President of the United States. This information is brought to you through the courtesy of *Sandy Goldman*, our man in North Haven, Conn. A clipping from the *New Haven Register*, dated September 8, 1968, has the headline, "Guilford man heads new party ticket backing McCarthy." The article goes on to say: "Although it may not be legally verified for some time, it is quite probable that Guilford now has a presidential candidate living here. *John Seiler* . . . a New Haven college teacher had no idea that he would one day become a presidential candidate for the New Party, a new political organization, when he began working for Senator Eugene J. McCarthy at a Massachusetts primary." The article tells that when a group of Connecticut residents began a signature drive in late August to get the New

Party on the November ballot, the residents discovered "that the candidates names for President and Vice President must be inserted." At that time, John Seiler's name was placed on the petition as candidate for President and it was hoped that later on McCarthy's name would be substituted. The article shows a picture of John standing next to a poster of Eugene McCarthy and quotes John as saying, "Sure, I know I'm not a real candidate, but this is a chance to get the party on the ballot, a chance to discuss issues in greater depth." Your editors have not at this time learned of the outcome of this endeavor or even if John's name was actually on the Connecticut ballot. However, we hope that this saga will be duly recorded in the M.I.T. Almanac.

Directing the director

Sandy Goldman is Chief Engineer at Intertech, an affiliate of the Picker Corporation. He and Mary Glen live in Branford, Conn. While we are on the subject of Connecticut, **Russ Meyerand** is now Director of Research for United Aircraft Company and in charge of the Research Laboratories in East Hartford, Connecticut. However, as Russ states in his letter, "The biggest thing that has happened to the Meyerands recently occurred on July 16th when Mary Grace gave birth to our first child, a bouncing baby girl, Mary Elizabeth. Mary Elizabeth is now very effectively directing the new Director and her mother, and has taken over the whole household completely."

At the Northeast Electronics and Engineering Meeting (NEREM) sponsored by IEEE, Douglas Sullivan was Chairman of the Session on Linear Integrated Circuits. He was also co-author of a paper during the Session entitled "A Monolithic Voltage Regulator with Foldback Current Limiting." Doug is in charge of the Linear Integrated Circuits Department at Transiron in Wakefield and is actively engaged in doing such things as putting 43 transistors, 6 diodes and 17 resistors on a chip of the dimensions of 70 times 85 mils.—Secretaries: **Mrs. J. H. Venarde** (Dell Lanier), 16 South Trail, Wilmington, Del. 19803; **L. Dennis Shapiro**, Aerospace Research, Inc., 130 Lincoln Street, Brighton, Mass. 02135

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Ed Boggs is the Associate in charge of Soils at Capital Engineering Corporation of Dillsburg, Pa. Ed is chairman of the Harrisburg Alumni Fund Drive and in his spare time is a Major and aircraft commander in the Pennsylvania Air National Guard. . . . **Hugh Bradley**, Senior Operations Research Analyst at Upjohn, has been appointed Editor-in-Chief of International Abstracts in Operations Research. . . . **Mac Edwards** was appointed Assistant Professor of Physiology at the University of Pennsylvania, School of Medicine, last July. In addition to his normal teaching activities, Mac is also doing research on the control of breathing. The Edwards were expecting

a second child in November and have bought a home in Swarthmore. . . . **Chuck Gorman** reports he has been with Rogers Corporation in Rogers, Connecticut since 1965 and is now Director of Purchases. He, Helene and their two sons live in Manchester.

Major Robert Hatcher is attending the 38 week Army Command and Staff School at Ft. Leavenworth. . . . **Louis Martel** has been named Manager of Fuel and Poison Development of the Materials Development Operation at Knolls Atomic Power Laboratory which is operated by General Electric. Louis, wife, Barbara, and four children live in Rexford, N.Y. . . . **Bernie Patnode** has been appointed Plant Manager of Monsanto's Santa Clara, Calif., plant. . . . **George Patterson** has moved to Sanders Associates as Program Manager of Satellite Systems, Data Systems Marketing.

Have you read **John Pierce's** latest publication "Partitioning Algorithms for a Class of Knapsack Problems?" Very Interesting! . . . **Max Plager** writes that he has bought a new house in an urban renewal area in Chicago and taught his first class in computer oriented math last summer. . . . **Regis Schultis** writes that he is now Senior Chemical Analyst with Smith Barney and is completing the requirements for a Ph.D. in Business Administration at N.Y.U. . . . **Art Sirkin** is training to be a broker with Walston and Company in New Brunswick.—Co-secretaries: **Bruce B. Bredehoft**, 16 Millbrook Road, Westwood, Mass. 02090; **T. Guy Spencer, Jr.**, M.I.T., Room E19-439, Cambridge, Mass. 02139

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The following news release came in from G.E. about **Bernard Cooper**. "Dr. Bernard R. Cooper, a physicist at the General Electric Research and Development Center, has been elected a Fellow of the American Physical Society. A native of Everett, Mass., Dr. Cooper received his bachelor's degree in physics from M.I.T. and his Ph.D. in physics from the University of California at Berkeley.

"Before joining G.E.'s research staff in 1964, Dr. Cooper served as a research scientist with the Raytheon Company; as a research associate with the Atomic Energy Research Establishment in Harwell, England; and as a research fellow with Harvard University. At the Research and Development Center, Dr. Cooper has specialized in the theory of solids, particularly the magnetic properties of solids. He is currently a member of the Light Production Physics Branch of the Electron Physics Laboratory. Dr. Cooper is a member of the American Association for the Advancement of Science and the Mohawk Association of Scientists and Engineers. Dr. and Mrs. Cooper have 2 children."

Vernon Porter has been appointed assistant to the superintendent of one of the rolling and finishing units at the

Pueblo Plant of C.F. & I. steel corporation. Vernon, who is a native of Pueblo, Colo., joined C.F. & I. in 1957 in industrial engineering. He is married and has two children. **Doug Mc Iver** participated in Harvard Business School's Program for Management Development this fall.

Abbott Johnson, '22, passed on to me the news that he ran into **Henry ("Gub") Cutter** while making a 93-day cruise of the South Seas and the Orient. The Springfield, Mass. **Sunday Republican** carried the following piece on **Mario Fontana**. "Mario H. Fontana received a degree of doctor of philosophy in mechanical engineering from Purdue University. Fontana is now assistant director of the nuclear reactor safety projects at the Oak Ridge National Laboratory, Oak Ridge, Tenn.

"A native of West Springfield, Fontana attended the local schools, graduating from West Springfield High School in 1950. He received his bachelor of science degree in mechanical engineering from the University of Massachusetts in 1955. Fontana received a master's degree in mechanical engineering from M.I.T. in 1957. While employed at Avco Corp., Fontana was granted a patent for his invention—said to be a breakthrough—in arc synthesis of heavy metal carbides. At Purdue he authored a thesis 'The Chemical Equilibria of Fission-Product Nuclear Fuel Mixtures: The Uranium-Oxygen and the System.' He is married to the former Sue Janeway of Concord, Tenn. They have two small sons."

Sidney Kleinberg received his Ph.D. from Lehigh in June and is now an assistant professor there in chemical engineering. Sidney specialized in kinetics. He is a member of the American Institute of Chemical Engineers, American Chemical Society and Society of the Sigma Xi.

I recently received the following Slant/Fin Corporation press release. "**Stanley W. Wand** has been promoted to vice president/manufacturing of Slant/Fin Corporation. At 33, he is the youngest officer of the heating and air conditioning company. Mr. Wand joined Slant/Fin as engineering manager in April, 1964. In February, 1966, he was promoted to manufacturing manager responsible for all production divisions including metalworking, machine shop, maintenance, production control, air conditioning and heating products. Wand has extensive training and experience in both the technical and managerial areas. He received his B.S. in mechanical engineering from M.I.T. in 1957 and a master's in business administration from C.C.N.Y. in 1964.

"Prior to joining Slant/Fin, Wand was a senior project engineer at Koppers Company and served as consultant to a number of companies including Bendix Corporation and Thiokol Chemical Corporation. He lives in Jamaica, New York, and has two sons, Adam and Jordan."

One of the 10 biggest

The August issue of *Forbes* carried the following article on *Charles Koch* and *Koch Industries*. "When *Koch Industries, Inc.* revealed its 1967 sales last month, there weren't many happy stockholders. Only 20 to be precise, because *Koch Industries* is one of the last large privately owned corporations in the U.S. Its 1967 sales probably make it one of the ten biggest. . . . Besides that, there were minority shareholdings in a clutch of other companies with sales that totaled about \$150 million.

"Why was *Charles Koch*, the company's 32-year-old president, giving the public a glimpse of his traditionally secretive company? 'We are changing this company and we need a corporate identity,' answers *Koch*. 'When we call *Dow Chemical* about a joint venture or when we try to pirate good people away from another company, we don't want them to say: 'Who is *Koch Industries*?' *Koch* has been changing the company ever since 1961 when he returned to *Wichita, Kan.* to help his father run the business. He's a chemical engineering graduate of *M.I.T.* and was an industrial consultant for 2½ years with *Arthur D. Little*. Back home, he took over the *Koch Engineering* subsidiary, made it the company's fastest-growing unit and the world's largest supplier of mass-transfer equipment for the chemical process industry. Now he is pushing *Koch Engineering* into pollution control, and another division into fiberglass pipes for the oil and chemical industries.

"While *Koch* has been emphasizing technology, he's been lucky to have his father's more old-fashioned *Rock Island Oil & Refining Co.* to build on. The elder *Koch*, who died last year, built a thriving company based on crude oil, natural gas transmission refinery construction and ranching.

"Last month *Rock Island* was renamed *Koch Industries*, and in a couple of years *Charles Koch* will probably take one or more of his technologically oriented subsidiaries public. But, as for the parent company, that's not imminent. *Koch* doesn't fear that he would lose control by going public: *Charles* and his twin 28-year-old brothers own 70 per cent of the stock. But *Koch* contends that by staying private the company can move faster and take more risks. Besides, he says, 'My father wouldn't have wanted to go public. He valued privacy above all else.' Never go public? 'Well, I value privacy, too,' *Koch* argues, 'but more than that I value achieving our business objectives.'"

I.T.&T. success at 34

A number of you may know *Robert Leonard* who received a master's degree with our Class. He has had a very successful career with *I.T.&T.* as the following newspaper article reports. "Elected to the presidency of *I.T.T. Data Services* in December, 1966, at the age of 34, *Robert A. Leonard* is one of the youngest men ever to serve as the

chief executive officer of any division within the world-wide *I.T.T.* system, and is a 128 World native. Born in *Medford, Mass.*, *Leonard* received his elementary education in *Watertown*, his school education at *St. Mary's High School* in *Waltham*, and his B.S. in mathematics from *Boston College*.

Following a brief period as a teaching fellow at the *University of Connecticut*, he undertook graduate studies leading to a master's degree in mathematics at *M.I.T.* During 1956 and 1957, while still at *M.I.T.*, he was a member of the research staff of that institution's *Instrumentation Laboratory* and made major contributions to experimental work leading to the development of the nation's first electronic missile guidance and control system. Upon leaving *M.I.T.*, he joined the *Sylvania Electronic Systems Division* in *Needham* and *Waltham* where his responsibilities included the direction of a wide range of electronic engineering and design activities, mathematical simulation studies and real-time design and programming applications on such major projects as the *Ballistic Missile Early Warning System*, *Minutemen* ground communications system and *Polaris* fire control system.

In 1962, at the age of 29, *Leonard* joined *I.T.T.* as director of Operations for the *Data and Information Systems Division* of *International Electric Corporation* an *ITT* subsidiary. Shortly thereafter he was elected vice president and director of *Systems Design and Programming* for the division. In this post he was responsible for the direction of *ITT's* activities in connection with development of the *Navy's Tactical Data System*, communications applications of the *ITT 7300 Automatic Data Exchange*, and real-time systems analysis program design and development work in the *465L Command and Control System* for the *Strategic Air Command*. During this period he was also responsible for the direction of the *I.T.T. Data Processing Center* in *Paramus*, and it was under his auspices that the center's commercial data processing service operations were expanded to the point that *I.T.T. Data Services* was established as a separate division of the corporation in 1965 with *Leonard* as its executive vice president and general manager.

A member of the *President's Council* of the *American Institute of Management*, *Leonard* is also chairman of the *Long Range Planning and Trends Committee* of the *Association of Data Processing Service Organizations*, and a member of the *American Management Association*, *Association for Computing Machinery*, *American Mathematical Society*, and *American Institute of Physics*. He also serves on several government advisory committees."

Here and there

Tidbits of information have been received through *Alumni Fund* contributions including the following: *George Waugh* is presently employed as manager of

equipment engineering for *United Nuclear* in *New Haven*. . . . *Ralph Garith Gray* has formed a partnership with his old friend in a beautiful office on the pier where boats dock and people fish at noon (Pier 1½, the *Embarcadero*, *San Francisco*). The office is for structural engineering practice but *Gary* is also a licensed member of the *A.I.A.* . . . *Tom Thompson* is a 2nd Vice President for the *Northern Trust Co.*, and works on *M.I.T.'s Educational Council* in *Chicago*.

Carl Hagge writes that he and his wife, *Nancy*, were also at the 10th reunion. (My sincere apologies, *Carl*, for the omission.) . . . *Bernard Wexler* is manager of *Information Systems Operations* for *G.E.'s Aerospace Electronics Department* in *Ithaca, N.Y.* . . . A second daughter was born to *Philip Presser*.

From *George Seiler*: "Ann and I are living in *Ardsley, N.Y.*, with our two boys and assorted pets. I am now assistant to the Vice President and General Manager of *Stauffer Chemical Company's Plastics Division*. . . . That's all for now. I trust you are all enjoying the New Year. Write when you have a minute to spare.—*Frederick L. Morefield*, Secretary, 18 Whaddon House, *William Mews, London, SW1, England*

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Welcome to the New Year! We are pleased to see that so many of you have resolved to send us news this year.

Ed Vinarub was at the reunion and told us that he is now working at *Kollsman Instrument Corporation* as a staff systems engineer in the new field of hydro-optics which involves the application of lasers to underwater viewing systems. . . . *John B. Ten Eyck* is out in *Colorado Springs, Colo.*, where he has been practicing architecture for the past five years. Currently, he is working on the design of a swimming pool for the city of *Colorado Springs* with *Fred Bert*, '22, who is with *Paddock Pools Company* there.

Richard Eiler has a new position as product marketing manager for *Electronic Arrays, Inc.*—a fledgling new company in *Mountain View, Calif.*, which is specializing in *MOS* large-scale arrays. He writes that "any sales leads will be appreciated." . . . *Edward B. Crowell* has been appointed as a fellow in hematology at the *University of Wisconsin School of Medicine*. . . . *Bob Hecht* received his doctorate in physics from the *University of Illinois* and is currently working as a research associate in the physics department at the *University of Pennsylvania*.

Alan Storms retires this year as president of the *M.I.T. Club of Western New York*. *Alan* was at the reunion and explained to us how a triumvirate of Class of '58 men have been in control of the club there for several years—the Board of Directors includes *Charles Diebold* and

Sandy Nobel as well as Alan. . . . *Richard Gottlieb* is still serving as director of Siemens Italy EDP Division which has been growing rapidly. He comments that "after two very hard years of work our efforts are beginning to pay off. The firm has grown from 1 to 140 people in the last 2½ years. We now have three children, two of whom are enrolled in the American School of Milan of which I am also a director." . . . *Donald Scott* is Vice President of Caldwell-Scott Engineering and Construction Company in Fort Lauderdale, Fla., and was appointed by Governor Kirk to the Governor's Commission on Urban Redevelopment in May, 1968, and was also appointed earlier to the Florida Construction Licensing Board.

Another entrepreneur!—*James Denker* was busily founding Nutron Corporation in June, while the rest of us were busily romping on the sand dunes at Provincetown. He is President of the company which will be engaged in the design and manufacture of fluid motors. *Edward Goldman* has been promoted from chief engineer to the new position of Vice President, Research and Engineering at Mitron Research and Development Corporation. The Goldman's also have a new son, Neil, who will be one year old next month. . . . *James Mc Namara* was appointed assistant professor of mathematics at the University of Rochester. . . . *Joseph Robertshaw* is an associate professor of physics at Providence College (R.I.). He is also serving as vice chairman of the department and is a member of the Reactor Utilization Committee for the Rhode Island Nuclear Reactor Project.

Dick Barone married the charming Miss Kay Brennan on August 3, 1968. Serving as Dick's best man was *Harvey Utech* who had flown up from Washington, D.C. Following their Bermuda honeymoon, Dick and Kay moved to Attleboro, Mass., where Dick is working for Texas Instruments. This past spring, both Dick and Kay worked on the class reunion and special thanks and good wishes come from the committee (who learned to be tolerant of Dick's understandable lapses of concentration).—*Michael E. Brose*, Secretary, 1171 North Street, Walpole, Mass.; *Antonia D. Schuman*, Western Associate, 22400 Napa Street, Canoga Park, Calif.

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Happy New Year to y'all in this '59 plus 10 (a non too subtle reminder of the great reunion coming up this June.) Now, without further ado, let's settle down to the nitty gritty.

Bridegrooms

John Weisbuch received his degree from the Harvard School of Public Health, and has taken up residence in Lexington, Ky., as an Assistant Professor at the University of Kentucky Medical School. He wed Miss Kathleen Sperry last January. . . . *Bob McAuliffe* graduated

from Harvard Business School in 1967, and is presently with Cabot, Cabot, and Forbes in Philly; he was married last April. . . . Still another recent bridegroom is *Wayne Worrell*, who entered the happy state last June with Judith Deignan in Philadelphia.

Enjoying work

Allen Ream received his M.D. in 1967, and interned at Stanford; he is now in the artificial heart program with the National Institute of Health. . . . *Malcolm Laughlin* has left Penn Central where he was Manager of Car Utilization, and is now a management consultant with Peat, Marwich, Mitchell, & Co. . . . *Emile Battat* tells us that he's been enjoying his work and travel as Manager of Corporate Diversification for Kaiser Aluminum and Chemical Corp. He's taken on added responsibility for strategic planning for the corporation, adding, "It's been hectic but fun!" . . . Also expressing enjoyment in his job, but this time as an earthquake expert, is *Ulrich Luscher*. After spending four years as an Assistant Professor in civil engineering at M.I.T., he moved to Oakland to work for Woodward, Clyde & Assoc., Consulting Soil Engineers and Geologists.

Ron Willey writes that he's recently begun teaching a course in optics at Florida Institute of Technology; his credentials for it are pretty good seeing as he's President of Willey Optical Corporation. Shunning commercial flights (maybe because of the proximity to Cuba?) he's flying an old rebuilt AT-6 fighter trainer for fast transportation on business trips. What time is left, Ron spends living on the beach with his wife and five children, and rebuilding pipe organs. He's working on his second now, this one for the church, while the other is in their home.

Carlton Gebhart has returned to the ranks of the students working on his Ph.D. at the Illinois Institute of Technology while teaching mechanics. I'm pleased to note that he's looking forward to seeing everyone at the 10th reunion. He chides me a little about the frequent shortage of class notes. Since I know that I deserve it, I'm not really bothered—particularly since I know that he'll be perfectly happy to join the long list of nominees next June who'll be just dying to accept a five-year hitch at the typewriter.

From the post box

With apologies for not keeping in touch recently, *Kent Kresa* sends news, not only about himself, but also about *Bill van Tassell*, *Jim Poor*, and *Charles Baker*. Kent left M.I.T.'s Lincoln Lab last year, and is now a program manager with ARPA (Advanced Research Projects Agency to those of you not acquainted with the lingo of the defense industry.) I understand now why I've heard Kent's name mentioned so many times around AVCO Everett. Bill was married a little over a year ago and has a son; he's working at Cornell Aeronautical Lab in Buffalo and finishing up his Ph.D.

thesis. Jim has moved from Florida to Alexandria, Va., and is working for MITRE. Chas has gone to Aerospace in San Bernardino.

Merrill Ginsburg is Senior Geophysical Interpreter at the Exploration Development Division, Geophysical Services Center, of the Mobil Oil Corporation in Dallas. He received his Ph.D. in Geophysics from the University of . . . (the trials of a class secretary—his letter was torn by whomever opened it, and the last line was lost. Alas.)

George Luedeke sends a very interesting note about his new corporation, Civil Systems Inc., which he has formed in association with several colleagues from Hughes Aircraft. The basic business of the firm, both in terms of hardware and studies, will be aimed at systems for traffic and transportation, resource management, industrial process control, and urban/rural sciences. The hardware includes computer-oriented data acquisition and control systems, non-defense in their application. He goes on to explain, "In our small way we hope to apply the aerospace rationale and technology to the more mundane yet more meaningful fields that everybody is concerned with in their daily lives—resource pollution, transportation, urban planning, etc." It sounds very interesting and worthwhile, George; we wish you the very best in your new venture.

A busy stork

George Barnett went into private law practice a year-and-a-half ago with Schaeffer, Kaher, & Dale in New York; shortly thereafter, he and his wife had a son, Alex. . . . Also on the newborn list is a daughter, Claudia, born to *Don* and *Cindy Spiller* last July 30; their third, I feel especially close to Claudia since our birthdays are the same (as are their and my anniversary).

Soon to join the list will be another child from *John* and *Lenore Rainey*. John writes a note that dares me to quote from it: "Daughter Kristin fat and sassy at ten months, wife Lenore sassy and fat with new fat and sassy child expected in January." Sorry, John, I couldn't resist printing it. John is presently teaching at the University of Tulsa; previously, after receiving his Ph.D. in math from RPI, he taught for a year at the Univ. of Kentucky. That's all for now. I've outdone myself writing notes twice in a row. You guys are going to be spoiled at this rate.—*Glenn Zeiders*, Secretary, AVCO Everett Research Lab, 2385 Revere Beach Parkway, Everett, Mass. 02149

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Jim Madden is working for Lizza & Sons, Inc., road contractors and highway construction, as a Civil Engineer. He writes that he is "estimating and running work in firco." (That last word is but an interpretation of what I think he wrote; other, more sensible interpretations are welcomed.) Anyway, Jim was married in

September 1960, now has two sons—James (7), and Chris (5).

Quickies

Bill Kleinbecker is with IBM's Hartford branch office, assigned to the Hamilton Standard account; he has two children—Carole Lyn (3) and Arnold William III (1). . . . **John Hughes** received a certificate of appreciation from the Alumni Association for his efforts on behalf of the 1968 Alumni Fund. John was Regional Chairman for Wellesley, Mass. Congratulations! . . . Commander **Donald Roane** is serving as Weapons Officer on the USS New Jersey (BB 62) in Southeast Asia. His commanding officer, Captain J. Edward Snyder, Jr., '56, USN, is also an M.I.T. graduate with an M.S. in nuclear physics. . . . **Jon Claerbout** is teaching in the geophysics department at Stanford. . . . **Richard deNeufville** has been named Associate Director of the new M.I.T. Urban Systems Laboratory organized with the \$3 million Ford grant to M.I.T. for Urban Systems Studies. . . . **Dave Camenga** is a senior resident in Neurology at Washington University (Barnes Hospital) in St. Louis. He expects to enter the Public Health Service in July 1969.

Vernon Yoshioka (who was chairman of section 23 back in 1956—how's that for old memories?) received a promotion from senior aerodynamics engineer to technical specialist at the Ryan Aeronautical Company in August 1968.

John Norris Maguire has been elected a vice president and member of the Board of Directors of CACI, a computer consulting firm with corporate headquarters in Santa Monica, Calif. He is also serving as Director of CACI's Washington, D.C. offices. . . . The *Boatwrights* (Barbara and John) are back in New England after spending several years in Colorado. John is Assistant Vice President, Engineering, of Northeast Electronics in Concord, N.H.

Douglas Knight is now a graduate student at Arizona State University starting on his Ph.D. in computer science (he already has an M.S.). Doug reports that he is married to Rose Marie Heywood and has two children, ages 3 and 5. They have lived in the southwest since 1961; he was employed as an exploration geophysicist with Shell Oil.

Henry Blyth has a new title, new position and new employer—he is President of Brooks, Inc., a corporation which retails sporting goods, toys and gifts. (The postmark looks like Park Ridge, Ill., for those who are interested.) **Patrick Spangler** was married to Susan Cassell on September 20, 1968. They will live in Laguna Beach. Pat is a senior scientist at the Aeronutronic Division of Philco-Ford in Newport Beach. Clearly this is all in California.

Quotes from the mailbox

From **Sheldon Epstein**: "This July I joined Brunswick Corporation as its New Business and Product Evaluation

Associate. My chief function is to identify new product opportunities for the 1970's. Of particular interest are the new high technology areas of statistical communications systems, bio-medical engineering, materials sciences, computer sciences and chemistry. Any interested classmate is invited to call me in Chicago. Brother-in-law and classmate **Same Latt** and Barbara gave birth to their first child and daughter (and my first niece) Allison Barbara on October 21 in Brookline, Mass. Our second child (and first daughter) Elizabeth Anne was born on October 8, 1967."

Phil Frink says: "after leaving M.I.T., spent six months in the army, then worked three and one-half years for a machinery manufacturer in Seattle. In 1964, with seven others, we formed a new securities firm in Seattle and bought a membership on the N.Y. Stock Exchange. My position is Vice President in charge of the Research and Trading Departments. Have two children, five and one-half and three and one-half, and expecting third in December."

And one last note from **Tom Alexander**, who has the most legible handwriting in the class so far: "I recently received from the University of California, Irvine, an M.A. in mathematics and I am now engaged in my third year (full-time) of graduate study in mathematics." Tom has joined the substantial group of us who have at one time or another been full-time students—that is, with no visible means of support except savings and any crumbs various financial aid offices have been able to produce.

Let us know

I am on the Alumni Council's Committee on Class Activities, and we have begun to meet and struggle with what the class activities are and should be. If you have any ideas or suggestions—particularly if you are rabid on some point,—write, phone or even wire if you feel strongly about it. And, actually, if you ever have any gripes or complaints about the various activities of the Alumni Association or the class, send them along. I'll try to get them to the right people for you. Or the wrong people—which is sometimes even more useful.

Keep practicing on partying it up—10th reunion is only a year and a half away. (Olympic champions practice for years; can we do less?) Send your progress report to—**Linda G. Sprague**, 10 Acorn Street, Cambridge, Mass. 02139

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The file is getting thin and I trust that you will all enclose your vital data with the Fund contributions so that this column won't be a blank so often. Only two letters came this month. **Terry Langendoen** happily reported the birth of his first child, one David Terence, last September 3. He goes on to say, "At the end of September my wife Sally, David

and I moved to New York City; I have a visiting appointment for the coming academic year at the Rockefeller University in Manhattan." He goes on to say that his first book, *The London School of Linguistics*, was published earlier in 1968 by the M.I.T. Press and the second book called *The Study of Syntax* was on the press last September. Reading about accomplishments like that makes me wonder what I've done with my life. Also moving to New York last fall was **John Vlcek** to work for the management consulting firm of Bonner and Moore Associates. John and wife Alice have a son named Eric.

Well that kills the letters: now for the clippings and press releases. **Dennis Pruslin**, who works at Lincoln Labs., has been spending time at the pin ball machine according to a lengthy article in the *New Bedford Times*. Apparently he has been looking at the innards of some of these monsters and has found that some are of a complexity "akin to a computer." The article says that the machines reduce the odds (make them worse for the player) as more nickels are put in. In addition if the player wins the odds get worse until the machine has gained back its losses. Sounds like a money press.

Over in the groves of academia some of our classmates are moving up the ladder. **Richard Hertzberg** moved from Assistant Professor to Associate Professor at Lehigh in metallurgy and materials science. **Robert Kaplan** is a research Associate of industrial administration at Carnegie-Mellon University in Pittsburgh. **Don Nelson** will be teaching 6.02 at M.I.T. this term. Capt. **Brock Strom** is over in Vietnam as a navigator in the 361st Tactical Electronic Warfare Squadron at Nha Trang. Also in the Air Force is Capt. **Drew Weyland**. He is program manager for overland radar at the Aeronautical Systems Division of Wright-Patterson AFB. This fall he started working toward an M.S. in electrical engineering at Ohio State University.

Grady Harris is now a "research specialist," what ever that means, at Esso's synthetic Fuels Research Lab in Baytown, Texas. According to the release "He is engaged in developing fuels from raw material sources other than petroleum. This involves responsibility for the operation of a pilot plant for studying the production of synthetic fuels from coal and oil shale." **Daniel Kennedy** is the person to get in touch with if you are interested in Laser Display systems. He is over at the NASA Electronics Research Center in Cambridge.

Well, the file is empty and there is nothing I can do about it until I hear from you illiterate slopbs.—**Andrew Braun**, 131 Freeman Street, Brookline, Mass. 02146

Sam Wayne Duncan and his wife, Beverly are completing studies in preparation for training preliminary to their missionary duties in the Belgian Congo. Duncan, who will teach science and mathematics in the West Congo Baptist Convention, is finishing a master's degree at U.S.C. He is a senior research engineer and teaches computer logic at General Dynamics, Inc., Pomona. This coming year both will study French, African culture and theology courses, followed by orientation and a year of French study in Belgium. They have a daughter, Jennifer Lynn. Mrs. Duncan recently received her B.A. in distributive social sciences.

Kurt D. Bleicken, Vice President of Investments, has been named to a special management group whose duties and responsibilities will be concerned with developing the mutual fund complex consisting of Egret Services Company, Inc., Egret Management Inc., and Egret Distributing Company, Inc. to its maximum potential. The Egret companies are the mutual fund affiliates of the Employers' Group of Insurance Companies. Mr. Bleicken was a portfolio manager and securities analyst with the John P. Chase organization prior to joining The Employers' Group in 1966.

Military honors were accorded in April to Lieutenant David J. Coker, 28, of Somerville, Mass., who was killed in an automobile accident in California, April 15. He was a U. S. Navy aeronautical engineer. He was the husband of the former Zofia Cymbalak of Chelsea, Mass.

Mount Holyoke College has appointed **Wayne D. Gass** Assistant Superintendent in charge of project planning. Gass will be responsible for the college plant, including the department of buildings and grounds, the golf course, and engineering and plant development. He will also be secretary to the buildings and grounds committee of the board of trustees. Gass, who was graduated from Deerfield Academy, received a B.S. with distinction in civil engineering from Worcester Polytechnic Institute, an M.S. in civil engineering from M.I.T. and is a registered professional engineer in Massachusetts.

The chemical peroxybenzoyl nitrate, recently discovered by **John M. Heuss** of General Motors research laboratories, and a co-worker, is 200 times more irritating than formaldehyde, and is an essential ingredient of the eye-irritating mixture that is contained in smog. They assert that structure, rather than chemical reactivity, is the key to smog's irritation of the eyes, and this discovery includes benzylic hydrocarbons and aromatic olefins. Interesting.

Quickies

Vijaykumar J. Shah, who set up his own investment firm, Life Investors Planning Company, in February of 1968, has

welcomed a new child into his family as of September. The Shah's have another child, Nina who is four. . . . **Richard A. Queeney** reports that both he and his wife, Donna, completed their Ph.D.'s in June, 1967, welcomed their first child, daughter Deborah, February, 1968, and are involved in building a house in State College. Richard stayed on as Assistant Professor of Engineering Mechanics and is head of Materials Microstructure Lab., at Penn State.

Barry J. Fidelman has recently joined Electronic Memories as Northeast Sales Manager, and will be relocating to New York City. . . . **Harold Metcalf** received his Ph.D. in physics in June, 1968, from Brown University and is now with the Physics Department, S.U.N.Y. at Stony Brook as Research Associate. He and wife, Marilyn, have two children, David (3½) and Cindy (10 months).

Richard P. Laeser reports that he and his wife, Carolyn, have a baby girl "Holly Marie" born January 10, 1968; he received an M.S. in electrical engineering from U.S.C., June, 68; and is now employed by Deep Space Network of J.P.L. as Project Engineer for Mariner '71 Mars Orbiter Mission.

Allan D. Pierce is now a member of the faculty of M.I.T. in the mechanical engineering. . . . **Frederick V. Lawrence, Jr.**, has been appointed Assistant Professor of Metallurgy in the Department of Mining, Metallurgy, and Petroleum Engineering, and Assistant Professor of Civil Engineering, M.I.T., beginning April 1, 1968, for one year.

Isaac Shantfield is now Systems Engineer with IBM Canada, in Montreal. . . . **John S. C. Yuan** joined the management science services Department of IBM, Armonk, N.Y., in October, 1967, received his Ph.D. degree in operations research from Stanford University, January 1968 and was married to Barbara Yen on June 15, 1968.

Allan L. Scherr, who received his Ph.D. in 1965 after working for M.I.T.'s project MAC for two years, is now in Programming Systems at IBM Poughkeepsie managing the design of a time sharing system. . . . **Scott L. Danielson** is now with John Carl Warnecke & Assoc., architects in San Francisco, as a designer working primarily on expansion of the San Francisco airport, also as consultant to S.R.I. on urban design and transportation.

Modesto A. Maidique expects to get his Ph.D. in Electrical Engineering at M.I.T. during first half of 1969 and is the coauthor of a paper at the March Linear I.C. conference in New York titled "Characterization and Application of a New High Input Impedance Operational Amplifier." . . . **William Mihalte**, account representative for IBM in New York City, was engaged to Miss Diana Kerry and due to be married in October. Congratulations, Bill. . . . **Stephen J. Warner** has accepted a position with the

newly created Resources Planning Staff at the Bureau of the Budget in Wash., D.C. and will be concerned with Government Resource Allocation Planning and long term commitment projections.

Wesley Wolf, who has been working for E. I. duPont since graduation, and his wife are expecting their first child in December, 1968.—**Gerald L. Katell**, Secretary, 310 Hoge Building, Seattle, Washington 98104

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H. A. Chester is a faculty member at the University of Pittsburgh, and has recently participated in a case study of a poverty program in southwestern Pennsylvania.

David Judelson's cousin, David Wernick, is now an M.I.T. freshman. **David C. Kelly**, S.M.'64, has been appointed an acting assistant professor at Oberlin College. . . . **Ronald Wilson's** brother-in-law, Bennett Wiseman, is now a freshman at M.I.T.

Mike Parker's brother, Tony, is a member of the Class of '72. . . . **Robert Scott**, who has been administrative assistant to Dean Brown (Department of Engineering at M.I.T.), has been promoted to Assistant Dean for administration. As such, he will be in charge of administrative duties in the School of Engineering. Bob is also chairman of our reunion committee, which is now planning for our first return to M.I.T. this June.

Francis Whitcomb, S.M.'64, has become a new associate of Caudill Rowlett Scott, a Houston based international firm of architects, planners and engineers. His position will be one of project manager and designer.

Hero of the month

Margaret MacVicar is clearly the Class Hero of the month, being the only one to write concerning her activities. Margaret received her Sc.D. in materials science at M.I.T. in 1967, and is now a post-doctoral fellow at Cavendish Laboratory in England. She teaches first year physics as part of her duties. This past summer she traveled in Eastern Europe and the Mideast, and this coming summer she plans a trip to Turkey. Following her travels, she will be returning to the Boston area.

Better late than never

Don Topkis clearly wins the honors for having the last word in our class questionnaire project from a year ago—he has just returned his form 14 months late! Don reports that he received his Ph.D. in operations research at Stanford, following which he taught a year at Yale. He is now an assistant professor of operations research at Berkeley, not to mention his yoga, camping, and other activities.

That's all the news I have. Let's have a few more Class Heroes next time (with oak clusters for giving news of

others as well as yourself).—*Ron Gilman*, Secretary, 1021 Oakmont Plaza No. 8, Memphis, Tenn. 38107

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Many of the more illustrious bachelors finally succumbed to that great institution of marriage over this past summer. *Bill Brody* married the former Miss Wenny Hull in June and is finishing up his Ph.D. work at Stanford. . . . *Mark Hanson* married the former Miss Pamela Marsters in May in New Haven. After graduating from Wellesley, Pam was working as a researcher for the National Council of the Aging in New York. Mark is now a consulting engineer with Bolt, Beranek and Newman in Cambridge.

Neil Lupton married the former Miss Claire Cook, a former Wellesley girl who is now doing graduate work in Medieval Studies at Yale. Neil is doing graduate work in chemistry there and is beginning to publish portions of his thesis.

Art Sindoris married the former Miss Lynne Parker after she graduated from Simmons College this past June. He is now a Ph.D. candidate in applied physics at New York University.

Bill Bohlke married the former Miss Laura Middleton (Smith '66) in June and is currently spending a two-year tour of duty at the Norfolk Naval Shipyard.

Charles Albers married the former Miss Kathy Hendrix, another native South Carolinian, last June. . . . And finally that stalwart of stalwarts, *Hank Lichstein*, was married on June 27th and is now on the staff of the Assistant Secretary of Defense in Washington, D.C. . . . *Mike Weiss* reports that his job with the Federated Metals Division of American Smelting and Refining took him to Norway over the summer. He was also best man at Bob Spitz's ('66) wedding to the former Miss Judith Hankin. Bob is working for M. W. Kellogg in Piscataway, N.J. Also from Mike: *Herb Trachtenberg* is working on his doctorate in electrical engineering at the University of Southern Calif. *Jim Postula* is working at General Motors and his second son was born last December.

Dan Diamond is currently a Sloan School doctoral candidate and working on a fairly active schedule including publishing an outgrowth of his thesis and presenting a paper in Las Vegas during the summer. . . . *Charles Gholz* reports that he is starting his training period to receive a direct commission into the Signal Corps. . . . *Richard Shultz* is an air force communications specialist at the Chicksands RAF Station in England. After completing his work at the Urban Studies Division of the Gulf South Research Institute in Baton Rouge, La., Gary Greeson and wife Nancy and son David have returned to Boston where Gary is now attending the Harvard Law School. . . . *Steve Brown* is finishing his masters work in physics at Stanford.

Frank Weigert completed his Ph.D. work in chemistry at Cal Tech and has joined DuPont's Central Research Department at the Experimental Station in Bellefonte, Pa.

Dave Miller and *Jim Elliot* spent last summer designing and building their own thirty-one-foot charter boat. . . . *Dave Saul's* ('64) cousin, Janet Saul is a freshman at M.I.T. this year. . . . *Bruce Fauman* is at the Stanford Business School working towards his P.D.

Lester Schmerr is a Ph.D. candidate in mechanics at the Illinois Institute of Tech. . . . *Steve Eberbach* is now working at the university of Michigan's Space Physics Research Lab after receiving his masters from their graduate school of business administration. . . . *Bill Roeseler* is coordinating the Boeing effort at gaining structural certification for the huge, new 747 aircraft.

A long letter from *Ron Brinkerhoff* indicates a wide set of experiences with Procter and Gamble since he joined them in June of 1966. Ron married the former Miss Rosanne Knight of Cincinnati last March and they're currently building an A-frame on about 25 acres east of Cincinnati. Ron also reports that *Carl King* will be completing his LL.B. at the University of Pennsylvania in June and will join the staff of the Chief Justice of the Massachusetts Supreme Court.

Dick Sidell was appointed Instructor in the ME department at M.I.T. . . . *Dennis Bekeny* will receive his masters in Nutritional Biochemistry from M.I.T. and will be forced to leave Boston for medical school. . . . *Dave Freeman* has taken a research position in theoretical physics at the University of Pennsylvania after completing his Ph.D. work in physics at M.I.T. . . . *John Larkin* received his Master of Divinity degree from Gordan Divinity School and he and his wife, Lucille, have entered training for missionary work in Nepal. . . . *Dave Kuperstein* is serving with the Army Engineers in Vietnam—*Jim Wolf*, Secretary, 24455 Lakeshore Boulevard, Apartment 1114, Euclid, Ohio 44123

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Greetings from Morocco! Your Secretary, after a year at Stanford Law School, decided to join the Peace Corps. During the summer months he attended a training session in Colorado where he studied French, surveying, and a little Arabic. Since September he has been working as an engineer with Services Provinciaux and the Agricultural Department in Beni-Mellal, Morocco, a centrally-located city near the foothills of the Middle Atlas Mountains. The work is primarily concerned with constructing irrigation canals and dams. The address at the end of these notes should be his address for the next two years, so you can easily write him directly. No excuses. Better yet, drop by if you happen to be in the neighborhood. Some of the ma-

terial for the class notes has been delayed in the shuffle between the United States and Morocco; hopefully everything will be here by the time the next article is written.

Richard Haberman works for Raytheon in Waltham as the project engineer in the Microwave and Power Tube Division of the manufacturing department. . . . Last June *George Solomon* received his M.S. in electrical engineering from Carnegie-Mellon University. . . . *Edson Hendricks* reports that he is still alive, but I don't know where he is. . . . *Mike Hawkins* is a Research Assistant at Berkeley; he is married to the former Margaret Buhala, a graduate of Jackson College.

Last spring *James Moorer* wrote that he was both a systems programmer for the Stanford A. I. Project and about to be drafted. Where are you now, Jim? . . . *Bob Steele* is a graduate student in Chemistry at Berkeley.

Art Neuendorffer has completed one year of graduate study in astro-physics at the University of Maryland. . . . *Mel Snyder* married the former Janice Siref, a graduate of the University of Wisconsin, late last summer. He has been attending the University of Cincinnati Medical School. . . . *Eric Johnson* married the former Kathleen Minadeo of Cleveland on July 6 and is working for Casting Laboratory, Chase Brass and Copper Company, in Cleveland. . . . *Ro Throp Bergh* is working for Robert E. White Instruments, Inc., Boston. . . . *Michael Greenebaum* has been working on infrared instrumentation for atmospheric physics applications at the Naval Applied Science Laboratory. In September he married the former Devorah Sheps, of Brooklyn, N.Y.

Last June, *Peter Holtzman* married the former Joan Martha Dinerman, a Boston painter. . . . *Allen Brown* received a 1968 National Medical-Sloan Foundation Scholarship; he is attending the Harvard Medical School. . . . *Steve Schroeder* has been graduated with honors from the training course for U.S. Air Force electronic equipment repairmen at Keesler AFB, Miss. I do not know his next assignment. . . . I have received word that three classmates have received their Master of Science degrees from Caltech: *Jim Rumbaugh* in astronomy, *Bob Dunlap* in aeronautics, and *Greg Jerrell* in electrical engineering. Bob also has his first child, Laura Ann, and is employed by R.E.Q. Systems in Redondo Beach, Calif.

Larry Constantine is the President of Information and Systems Institute, Inc., an innovative computer consulting and educational firm based in Cambridge. He has authored papers and articles on both hardware and software, and his book, *Concepts in Program Design*, is now in its second edition.

Robert Bruneau is doing graduate work in mineral economics at Penn State University. Last January he married Lynn Wiesenberger, also of M.I.T. . . . *Dave*

Schramm qualified for the final Olympic wrestling trials in the 213.5 pounds weight class. . . . **Stephen Metz** was married in August, 1967, and is a Ph.D. candidate in metallurgy at M.I.T. . . . **A. P. Olson** joined the Argonne National Laboratory, Idaho Division, as an assistant nuclear engineer in September, 1967.

Marcellus Snow, M.S., received a scholarship to John Hopkins University Center, Bologna, Italy, where he and his wife spent the 1967-1968 school year. While in Europe he made trips to Common Market countries to observe the EEC in action. He has returned to the United States and John Hopkins University for the 1968-1969 school year.

Richard Rettig, Ph.D., worked from March 1967 through April 1968 in the Bureau of the Budget, Executive Office of the President, where he reviewed Department of Defense research and development programs. Since May he has been with the Department of Higher Education, State of New Jersey, working on relating higher education to the problems of the cities. In February he will begin as Assistant Professor at the Cornell Graduate School of Business.

Massachusetts State Representative **Chandler Stevens**, Ph.D., announced that he was a candidate for the U.S. House of Representatives (Third District of Massachusetts). In 1964 Stevens became the first Massachusetts legislator to win election without the support of either major political party since 1913, and in 1966 he won re-election by almost a two-to-one margin over the Democratic Party nominee. Among many things, he was a founder and first chairman of Citizens for Massachusetts, a reform organization. At the time of this writing I do not know the results of his election campaign. (Ed. note—Mr. Stevens was not elected to the House.)

Brendan Geelan, S.M., is presently serving as a second lieutenant in the chemical process engineering section at the Army Ammunition Procurement and Supply Agency. . . . In September 1967 **David Iverson**, S.M., received a direct commission as a second lieutenant in the U.S. Army Adjutant General Corps; he is at Fort Hamilton in Brooklyn, N.Y. . . . **Paul Chapin**, Ph.D., is Assistant Professor of Linguistics at the University of California at San Diego. . . . The "Interesting Occupation of the Year" award goes to **John Bower** who is on a one-year research project at the South Pole and cannot be reached by any mail service. He last reported by radio that it was 85 degrees below zero with a 65 mph wind. And you think you have it tough. . . . **Fred Keene** is studying mathematics at Berkeley on an NDEA Fellowship. . . . **Edison Tse** has been a Teaching Assistant and a Research Assistant in the department of electrical engineering at M.I.T. since 1966. I recently received an article that he had co-authored for the *IEEE Transactions on Automatic Control*. . . . **Neil Daykin**, S.M., is in the U.S. Navy.

Mehmet Azizoglu is employed by Hercules' Fibers and Film where he has been studying the surface properties of polypropylene film. . . . **Carol Shattles** and **Robert Hooker** were married in September, 1967, and are both doing graduate study in chemistry at Purdue University. . . . **Marc Schulman** is a systems programmer in the Systems Development Division of IBM in Poughkeepsie, N.Y. . . . **Herbert Schulze** has completed his first year at the University of Chicago Law School. . . . **John Jamieson** is working as a Propellant Systems engineer for the Saturn V Program at Kennedy Space Center. . . . **Bill Caton** is attending the University of Southern California School of Medicine.

John Hiatt is employed with Hewlett-Packard in Palo Alto, Calif.—**Jim Swanson**, Secretary, Services Provinciaux, de la Mise en Valeur, Beni-Mellal, Morocco

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Mike's been including me as his co-secretary these past few months on the basis of only minimal participation, so this month, I make up for the free title by writing the whole column.

Class statistics

The recent President's Report contained the following figures of interest to our Class: 65 per cent of the Class entered graduate school this year and 24 per cent entered business or industry, as opposed to last year, when 77 per cent went to graduate school. The drop in the number of people attending graduate school is attributed to the changes in Selective Service rules. Also, the median salary offered to members of our Class was \$775 per month. Another statistic about our Class: In June 100 fewer bachelor's degrees were awarded than in the previous year, the manifestation of a sudden interest in five-year programs.

Marriages

I'll do things my own way and report the marriages first. **Art "Toad" Cole** married Joanne "Stanley" Haponik, '70, in September. Art is now doing graduate work in Civil Engineering at M.I.T.

Richard Ehrenkranz married Ellen Swerdel in Woodbridge, N.J., late in August. Dick is now at State University of New York Downstate Medical Center. Ellen is from B.U. She's student teaching in New York this year. . . . One other wedding we know of—**Bob Levasseur** to Pauline Laitrees, also in August. Bob received both an A.B. from Bowdoin College and an S.B. from M.I.T. in June, and is now studying for a master's at the Sloan School.

From near and far

Bill Klauber is living here in Eastgate with his wife Marge. Bill is going for two bachelor's degrees, and Marge works at Honeywell as a programmer. In her spare time she serves as the neighborhood Avon representative.

We had news from a few students who've wandered farther from the old fold: **Ken Marko** is studying for a Ph.D. in Physics at University of Michigan.

Bill Dillaway is a graduate student in mathematics at University of Rochester, and **Philip Fenn** is studying in the Geology department at Stanford. . . . **Bob Roach** graduated from an IBM training school in Systems Programming, and is now doing a four-year stint in the Navy. . . . Last June, Lieutenant **David Greene**, also in the Navy, received the Brand Award, an annual award to the Naval post-graduate student who stands first in the Naval Construction and Engineering Program (Course XIII A) at M.I.T. Dave is continuing here for his Sc.D. He lives in Arlington with his wife, the former Penelope Cykowski, and their two sons, Andrew and Colin.

George Glass is now at the University of Washington, with his wife Patricia and their daughter Sarah. He is an Assistant Prof. . . . Last but not least, **Paul Freshwater** is now a Brand Assistant with Procter and Gamble Company in packaged soap and detergent advertising. He has been active in the United Appeal Fund Drive.

That's all the news we had this time. In case you didn't know, photographs are welcome with your news and will be printed in the column. Shutterbugs, get snapping!—**Gail and Mike Marcus**, 60 Wadsworth Street, Apt. 4H, Cambridge, Mass. 02139

Course Review

Copy for this issue of *Technology Review* was due from your Secretary on November 10. Information reaching him after that date will be reported in the February issue.

V

The October/November *Technology Review*, and many newspapers and scientific journals, reported "A versatile, Inexpensive Routine to New Forms of the Drug" a total synthesis of penicillin. The research was reported by *Ajay K. Bose*, Sc.D. Chemistry, 1950, of Stevens Institute of Technology at the 5th International Symposium on the Chemistry of Natural Products in London. Dr. Bose registered as a candidate for the doctorate in June 1947 with support from the Secretary of Education, Government of India, New Delhi. He was awarded the doctorate in June 1950 and accepted a postdoctoral fellowship at Harvard University to work under the direction of Professor Robert B. Woodward. In 1951 he returned to India to teach at the Indian Institute of Technology, Hijli, West Bengal, India, and later became a research associate at the University of Pennsylvania in the laboratory of Dr. C. C. Price (1956-1957). Since 1961 he has been a Professor of Chemistry at Stevens Institute of Technology, Hoboken, N.J. He was awarded the B.Sc. degree in 1944 from the University of Allahaba and the B.Sc. from the same institution in 1944. While at M.I.T. his research was directed by Professor John Sheehan.

Donald M. Black, B.S. Rensselaer Polytechnic Institute 1942, Ph.D. M.I.T. June, 1948, and Mrs. Black (Elizabeth M. Sackman) B.A. Mount Holyoke College, May 1945, S.M. Chemistry M.I.T., February 1947, called in late September. They were delivering their son, Donald T., on campus for his second year as an undergraduate. Donald M. is the director of Commercial Development for Geigy Industrial Chemicals. They live in Ardsley, N.Y. Mrs. Black's research was directed by Professor George Scatchard and after the award of the master's degree she worked in industry and at the Harvard Medical School on a project related to her thesis.

Walter M. Bryant, III, B.S. Virginia Military Institute June, 1961, R.O.T.C., 2nd Lieutenant (V.M.I.) was awarded the Ph.D. in organic chemistry in June of 1966. The following was taken from the

Edgewood Arsenal News. "Captain Walter M. Bryant, III, a chemical officer assigned to Edgewood Arsenal, has been awarded the Army Commendation Medal for Meritorious Service. Captain Bryant was cited for exceptionally meritorious service while assigned to the development of the U.S. Army Chemical Information and Data Systems Project. His diligence, forcefulness, broad chemical knowledge, and a marked ability to grasp new concepts have overcome many varied technical obstacles in the project's progress toward its ultimate goal. In addition, he was hailed for his commendable attitude as a military officer which has creditably influenced the actions of his subordinates." His research was directed by Professor Herbert O. House at M.I.T. Captain Bryant is married to the former Sandra Stennett of Lynchburg, Va. They have a two-year-old son, Michael Steven Bryant.

Leland L. Estes, B.S. Virginia Military Institute 1943, joined the Chemical Warfare Service in 1943 and served for three years—terminating with the rank of Captain in June of 1946. While in service he was awarded the Bronze Star and Purple Heart. He was at M.I.T. June 1946 to June 1949; his work toward the doctorate was directed by Professor Arthur C. Cope. The degree was awarded in 1949. When he joined the DuPont Company as a research chemist in December 1964, he was assigned to the Old Hickory Plant, Research and Development Laboratory, Old Hickory, Tenn. We have recently been informed that he has been promoted from associate director of Public Relations to director of Public Relations, Rice University, Texas.

Richard D. Fink, A.B. Harvard College 1958, Ph.D. Course V September 1962, an assistant professor at Amherst College, has been granted leave during the 1968-1969 academic year to carry on research at King's College of the University of London. He was named a Science Faculty Fellow by the National Science Foundation. Mr. Fink held National Science Foundation and National Institutes of Health Predoctoral Fellowships while a student at M.I.T. and was also awarded one of the Eastman Kodak Company Fellowships for the academic year 1960-1961. On completion of his re-

quirements for the doctorate he studied at Yale University under a National Institutes of Health Post-doctoral Fellowship and then joined the staff at Amherst College. The Fink's have announced the birth of a daughter, Johanna Hovenden, March 23, 1968.

Russell B. Hodgdon, Jr., S.B. Course V July 1951, joined the U.S. Air Force after graduating from preparatory school and served in the American and European theaters for 2 years and 8 months prior to entering M.I.T. While at M.I.T. as an undergraduate, he was enrolled in the Air Force ROTC where he held the rank of Cadet Captain. In 1953 he was admitted to Columbia University as a candidate for the doctorate which was awarded in 1957. He has recently been named Assistant to the Vice President-Research at Ionac Chemical, Birmingham, N.J. from Senior Scientist, General Electric Company, Lynn, Mass.

James D. Macomber, B.S. University of California at Berkeley, February 1960, was awarded the doctorate in Physical Chemistry in June 1965. He entered the service and was assigned to Fort McClellan, Alabama for two years of active duty—U.S. Army Chemical Corps, 1st Lieutenant. He has joined the staff of the Louisiana State University as an assistant professor of physical chemistry with emphasis on lasers and theory.

VI

Wilmer L. Barrow, S.M.'29, retired Nov. 1, 1968 as Vice President for Research and Development, The Sperry Rand Corporation. In anticipation of this event, staff members of the Sperry Rand Research Center in Sudbury, Mass., hosted a reception in his honor at the historic Wayside Inn. Dr. James E. Shepherd, Manager of the Center established under the direction of Dr. Barrow in 1960, presented the honored guest with two bound volumes, one containing copies of his 26 patents, the other an equal number of technical papers authored by him.

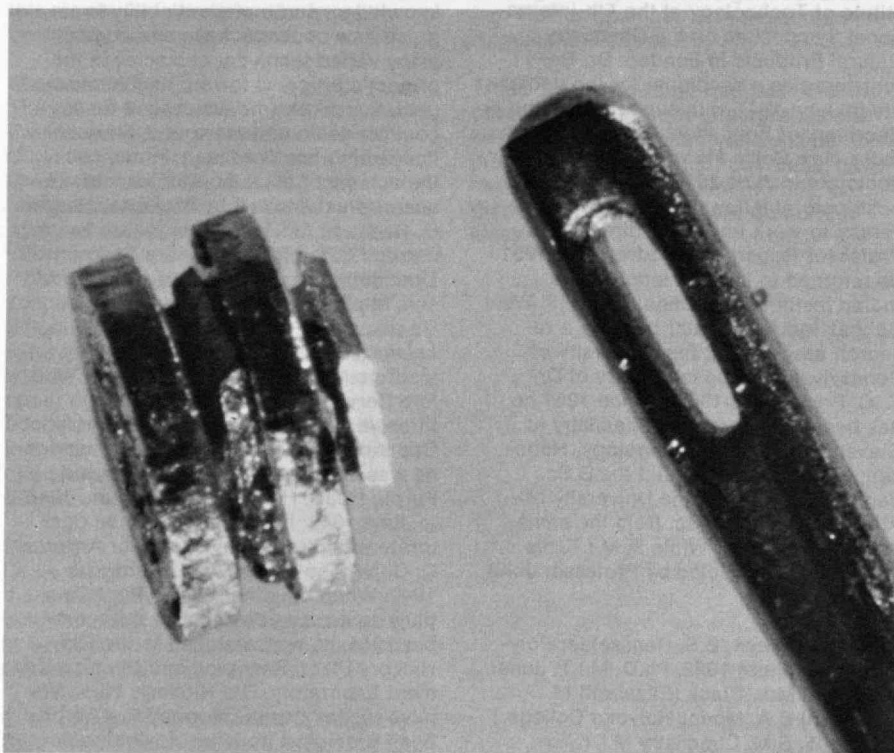
His theory, research and applications of UHF propagation in waveguides and radiation from horns, known as "Barrow horns", won him widespread recognition

in government, industry and technical societies. A Presidential citation following World War II was "in recognition of . . . outstanding services . . . in the field of microwave radar development, which proved to be an invaluable contribution to the war efforts of the United States and its Allies." Following his graduate work in communications at M.I.T. he studied at the Technische Hochschule in Munich, Germany, where he received the Sc.D. degree in 1931. Returning to the Electrical Engineering staff at M.I.T. he became a pioneer in microwave technology and made major contributions to the "blue series" of electrical engineering textbooks written anonymously by the Department. In June 1941, Dr. Barrow became the Founding Director of the M.I.T. Radar School. In 1943 he resigned his Associate Professorship to become Research Director of the Sperry Gyroscope Company. In 1947 he became Chief Engineer and in 1952 Vice President. In 1966 he received the Edison Medal of the IEEE. His home address is 92 Grist Mill Lane, Manhasset, N.Y., and in the summer, Mirror Lake P.O., N.H.

Marcellus B. McDavitt, S.M.'26, retired last August after a career of 43 years with the Bell System. He started in the Development and Research Department of the American Telephone and Telegraph Company and has been a Vice President of Bell Telephone Laboratories since 1961. As a result of Mr. McDavitt's retirement, James W. Fitzwilliam (VIII Ph.D. '47) became Executive Director of the Telephones Division, moving to that position from the Sentinel Radar Laboratory where he was Director. Earlier, as Director of the Electron Device Laboratory, he was responsible for the development and design of the microwave tubes used in the Telstar satellite and in the ground station at Andover, Maine, and for the major portion of the mechanical engineering development, design and testing of the satellite.

Paul J. Shaver, S.M.'62, Sc.D.'65, and two associates at the General Electric Research and Development Center have recently demonstrated that Gunn-effect diodes can be operated successfully in direct series connection, an electronic feat previously believed impossible. The scientists believe that in this form of operation, higher levels of microwave power should be possible than from any previously known solid-state device. The key to this achievement is to prevent complete high field domain formation in any diode in the series string. This is accomplished through operation of the series-connected diodes in a tuned circuit at a frequency higher than the transit-time frequency. Other conditions must also be met, but diodes which differ as much as 20 per cent in doping density can be used.

Yoshihiro Iwadare, E.E.'64, is with the Nippon Electric Company, Kawasaki, Japan. Following his studies and research on error-correcting codes at M.I.T. under the direction of Professor Gallager and others, he spent about



seven months at the University of California at Berkeley and then returned to the University of Tokyo where he received the Ph.D. degree in the same field in 1967. A paper based on his doctoral dissertation was published in the July 1968 *Transactions on Information Theory*. In his present position, he is chiefly concerned with communication theory and information processing.

Samuel Lieben, S.M.'33, is Chairman of the Board of ATAR Computer Systems, Inc., which has developed the Automated Travel Air Reservations System to enable travel agents to determine space availability and issue customer

Paul J. Shaver, '62, Wirojana Tantarporn, and SePuan Yu (left to right top picture) examine a coaxial cavity microwave circuit containing two series-connected Gunn-effect diodes. The Gunn-effect diodes (lower picture). Measuring 40 thousandths by 65 thousandths of an inch, the tiny circuit is composed of two gallium arsenide chips—the Gunn diodes—mounted between metal wafers which provide electrical contact points and act as heat sinks.

tickets almost immediately. Scheduling information is stored in airline company computers and is constantly up-dated to supply current readouts on cathode-ray tubes or teletypewriters. Mr. Lieben was one of the founders of Circuit Foil Corporation of Bordentown, N.J. in 1955 and also helped to start Ferrody-namics Corporation and Metex Corporation, now merged, with Mr. Lieben as one of the Directors. He says his wife is a clinical psychologist, his son an M.D. now with Uncle Sam and his daughter married to a Professor of Philosophy. He also assures us that his four grand-children are all grand. His address is 285 Fountain Road, Englewood, N.J. 07631.

Robert J. Goad, S.M.'56, E.E.'58, has been made Resident Manager of the recently organized Guidance and Control Department of the Systems Group of TRW, Inc., in Cambridge, Mass. The new department provides close support for TRW's work with the NASA Electronic Research Center and with other avionics and space customers in the Greater Boston area. Mr. Goad came to Cambridge from TRW's Houston Operations where he was Head of the Control Systems Analysis Section. The TRW Systems Group is a major operating unit of TRW Inc., where more than 70,000 people at over 250 locations around the world are applying advanced technology to electronics, space, defense, aircraft, automotive and related industrial and commercial markets. He and his wife, Jeanniene, and their three children make their home in Lexington, Mass.

Major George E. Wien, S.M.'64, is one of the 1,344 military officers of the United States and 51 allied nations selected to attend the U.S. Army and General Staff College in Fort Leavenworth, Kansas, this academic year. The purpose of the course is to prepare the officers for duty as commanders and principal general staff officers at division or higher command levels. More than half the students have seen action in Vietnam, and 352 returned from the combat zone to attend this course. The class will graduate June 6, 1969. Major Wien received his B.S. degree at West Point in 1956.

Roger H. Tancrell, S.M.'58, has completed requirements for the Ph.D. degree at Harvard University to be awarded at the graduation exercises in June. His doctoral thesis is "Nuclear Magnetic and Quadrupole Interactions in Garnets."

He was a teaching fellow and research assistant during his Harvard program and is now employed as Research Scientist at the Raytheon Research Division, Waltham, Mass. He had worked for Raytheon in the summer of 1955 while an undergraduate student at Worcester Polytechnic Institute. He was a staff member at Lincoln Laboratory from 1956 to 1960.

Isaac Goodbar, S.M.'45, has been elected a Fellow of the Illuminating Engineer-

ing Society and was publicly honored at the National Technical Conference in Phoenix, Arizona, September 9, 1968. More than 30 patents have been issued to Mr. Goodbar and he is known for his developments in luminaire design for high efficiency and low brightness, weather-controlled street-lighting luminaires, and plastic lenses producing the batwing distribution. He is Chief Engineer for Edison Price, Inc., New York City and member of several IES technical committees. His undergraduate work was done at the University of Buenos Aires, Argentina, where he showed an early interest in electric lighting, having developed a method for low-voltage light control.

E. Joe Shimek, S.M.'31, has been named a member of the Rice University Board of Governors. He is one of four elected to a new category known as the Alumni Governors, these positions to be filled in the future by an election of the Rice alumni. Mr. Shimek received the B.S. degree from Rice in 1929, and has been actively engaged in geophysical exploration since 1936. He was a founder of Geophysical Associates which was later merged with EG&G International, Inc., of which he is currently Vice President.—**Karl L. Wildes**, Correspondent, Room 4-232, M.I.T., Cambridge, Mass. 02139

XVI

Instalment 3—an opportune time to wish all of you the best of everything in the year ahead. As this is written we have just elected a new president, there is a bombing halt in Vietnam which may or may not have proved something by the time you read this, and both American and Russian astronauts have chalked up big gains. Nineteen sixty-nine should be a year to watch. It will certainly be a year of change.

Leonard J. Baker, '57, made a change some time ago. After a stint with the Navy's Special Projects Office, as head of guidance development for the Polaris missile, he went to California with Northrop Nortronics. There he became head of the Advanced Avionics Laboratory and a Deputy Director. Len lives in Palos Verdes Estates, is married and has two children.

Anthony R. Nollet, '51, has made a great many changes. After leaving M.I.T. he spent two years with BuAer, followed by another year as exec of the Marine Corps All-Weather Squadron in Korea. Then followed duty at Armament Test, Naval Air Test Center, and finally in the Marine Corps Equipment Board in Quantico. With twenty years service, Tony then retired. As a civilian he worked first for GE in Weapons Systems, then in 1965 went with Geophysics Corporation of America, Technology Division, as Director of Marketing. "Frankly, I'm surrounded by physicists, and I do not understand all that they talk about."

Commander John E. Draim, USN, has also been getting around a bit since he left us in 1956. After a tour with Fighter Squadron 73 in the Mediterranean, he reported to the U.S. Naval Missile Center at Point Mugu, Calif. Most of his time there was spent as Program Manager of PROJECT HYDRA, conducting feasibility studies in the vertical-floating (spar buoy) launch method for rocket vehicles. After four years he had carrier duty again, this time with a Heavy Attack Squadron FIVE based in Florida, and then to the Armed Forces Staff College in Norfolk. Then he was with NATO in Paris as Deputy Director, Navy Armaments Division, U.S. Mission, and now is back at M.I.T. for further study.

With a group that gets around as much as ours does, **Paul F. Hayner**, '51, has established something of a record. He was one of the founders of Sanders Associates in Nashua, N.H., and is still there. He is manager of the Product Research Department, supervising R & D activities in various fields. Probably another record for our group—Mr. and Mrs. Hayner are the parents of eleven children. Must have read Mrs. Galbraith's *Cheaper By The Dozen*. Some of you will remember **Lawrence Levy** as a member of the Department around 1950. He got his Master's in '48, and in 1951 formed his own company, Allied Research Associates, Inc., in nearby Concord. There was time out for a stint as Representative of the Secretary of Defense in Europe, North Africa, and the Middle East, also as Defense Advisor to the U.S. Ambassador to NATO, then a couple of years with Raytheon as a Vice President, and finally in 1965 back to Allied Research as President, Chief Executive Officer, and Director. In case you don't know, Allied does research, development and production in a great number of fields, aeronautics and astronautics among others. One man who doesn't have to work very hard at remembering Larry is **Hubert I. Flomenhoft** '47. They worked together here under Ray Bisplinghoff almost twenty years ago. And now they're back together again. Hubert is General Manager of Allied Research's Sciences and Systems Division, and just to complete the picture, Ray Bisplinghoff, now Dean of Engineering at M.I.T., is a director and Senior Technical Consultant of ARA. Hubert's division is evidently doing some interesting work as evidenced by one research he mentioned "in modern structural/materials design through a basic understanding of stress concentrations in elastic and non-elastic structural elements, and in applications of photoelasticity to such cases as windows for deep-submergence vehicles."

After receiving his master's degree here in 1959, **Robert F. Weiss** went on to earn a doctorate in aeronautics and astronautics at NYU. Since that time he has been in a Principal Research Scientist with Avco here in Everett, engaged in

theoretical research in hypersonic gas dynamics and re-entry physics, with his main interest in the theory of the "near wake." Bob lives north of Boston in Lynnfield, is married and has three daughters. Another man who earned his Sc.D. in aeronautics and astronautics, but with us, is *Martin A. Garstens*, '41. Mr. Garstens is with ONR in Washington in charge of Solid State Physics research for the Navy. "I am also engaged in sponsoring work in biophysics, an area of personal interest to me." Ten years ago the Air Force sent *Carl E. Stone* to us to learn about weapons systems. After duty in various spots, including Japan, he was sent to frigid Grand Forks AFB in North Dakota when the first Minuteman II wing was activated there. He is a Missile Combat Crew Commander, 447th Strategic Missile Squadron, 321st Strategic Missile Wing (SAC). Major Stone is doing a very interesting switch. "Unless a person is engaged intimately in a particular (engineering or science) area, the passage of just a short time will render him obsolete . . . changes in human behavior evolve over a period of time and are thus easier to keep up with." With this in mind the Major has been attending classes for some time at the University of North Dakota, and by now should have received his M.S. in a field intimately concerned with human behavior, counseling and guidance.

Lieutenant Colonel *Noah C. New*, a Marine Corps aviator, was with us long enough to earn an Sc.D. in 1963. From Cambridge he went to the Far East, including Viet Nam, for a year, then back to the Naval Ordnance Test Station at China Lake, Calif., as Senior Marine. "My job, in part, includes keeping the Marine Corps abreast of the weapons developed here (Sidewinder, Shrike, Walleye, among others)." Noah's principal hobby is amateur radio "using the electronic knowledge I gained at M.I.T." He has a very modern and powerful single side band and teletype radio station set up in his home. Noah, if this is one of your interests, let me know. May be we can get some of you hams together this way.

As is only logical, Holloman AFB in New Mexico always has a concentration of our people, and that's certainly true of the 1964 Air Force men. *George L. Watts*, '64, sent us news of several. He went out there himself directly after graduation and for two years conducted various programs on the supersonic sled test track. Then he went to Germany for a year in an Air Force training program in missile and satellite tracking and geodetics at the Deutsche Forschungsanstalt für Luft und Raumfahrt. This is where the use of initials comes in very handy. It is also known as DFL. Probably the Germans are happy to refer to us as M.I.T. for the same reason. By now Captain Watts is presumably back at Holloman. Unless they have been reassigned since his letter, and that's entirely possible, he would rejoin classmates *Paul Pirtle* and *Jim Gallo*, who

were assigned to the Guidance Directorate. Paul was in Operations working, among other things, on the Sabre system. *Dino Lorenzini* has left Holloman and now is back at M.I.T. for doctoral work. Captain *Dick Schulte*, with the Directorate of Foreign Technology, was married in 1966. The Schultes are living on the base. *Don Pearson* was with that same Directorate, and Captain *Darrel Ramhorst* was in the Space Systems Division. *Gary Comfort* is also back at M.I.T. for doctoral work. As you can see, that's quite a concentration of '64 men.

Bobby L. Marlow, '53, a Lieutenant Colonel in the Air Force, has probably retired by now. At least he planned to do that, and after his last tour of duty he was no doubt ready for it. It was a year spent as Deputy Director, Tactical Air Analysis Center, Headquarters, 7th Air Force, Tan Son Nhut AB. . . . So much for now, and if I may quote those fun-loving Apollo 7 boys quoting Dean Martin, "Keep those cards and letters coming."—*Professor Walter Wrigley*, Correspondent, IL3-419, M.I.T., Cambridge, Mass. 02139

Sloan

Richard J. Howe, '65, has recently transferred from Esso Production research to Humble Oil and Refining Company as Assistant Manager of the East Texas Division in Houston, Texas. . . . *William H. Anderson*, '52, has been promoted from Executive Assistant General Sales Manager to General Sales Manager of the Frigidaire Division of General Motors, Dayton, Ohio. Mr. Anderson has been associated with General Motors for 22 years. . . . *Robert L. Seaman*, '68, has been named director of corporate planning for the Raytheon Company. He will be responsible for analysis and recommendations on the company's goals, planning policies, and special business studies. He had served earlier at Raytheon as assistant controller for management information and financial analysis.

Harold N. Bogart, '54, has been elected president of the American Society for Testing and Materials. Mr. Bogart, director of the Numerical Control Office Manufacturing Staff, Ford Motor Company, Dearborn, Mich., has been on the ASTM Board of Directors since 1963.

Harrison T. Price, '55, recipient of a Distinguished Alumni Award at Tri-State College in 1967, will serve as one of three alumni elected members of the Board of Trustees of the college. The distinguished Alumni Awards were instituted in 1955 to honor alumni for outstanding achievement reflecting credit on their Alma Mater. . . . *M. Wren Gable*, '39, resigned from the Eastman Kodak Company; he was No. 3 man in the corporation's management, serving as Executive Vice President and a director.

Society of Sloan Fellows: New Officers and New Plans

Prominent among the urges that bring members of the Society of Sloan Fellows together for reunions at three-year intervals at M.I.T. "is to make sure that every one who comes after them works as hard as they did," said Peter P. Gil, Associate Dean for Executive Programs at the Sloan School, in opening the meeting of the Society at the 1968 Sloan Fellows convocation (see above). He was thereafter at considerable pains to assure more than 250 former Sloan Fellows that, whatever their seniority, M.I.T. was indeed keeping faith. There have been innovations in the program, including changes to focus increasingly on the social environment of business. But there is no lessening in its rigor.

Four new governors of the Society were named during the meeting—Walter Fisher, Jr., S.M.'64, for three years and G. Lowell O'Daniel, S.M.'53, William M. Zarkowsky, S.M.'58, and William J. Stolze, S.M.'60, for four years. William G. Kay, Jr., S.M.'63, will serve as President of the Society for the next three years, Mr. Zarkowsky as Vice President and National Chairman, Mr. Stolze as Treasurer, and Goff Smith, S.M.'53, as Secretary.

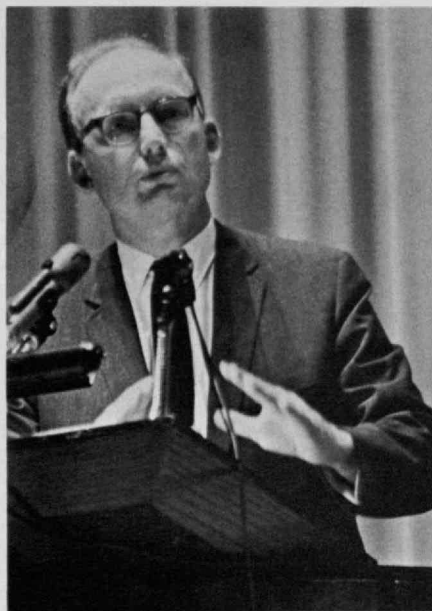
The Society's contributions in support of the Sloan Fellows Professorship in industrial management have increased 45 per cent during the two years of Mr. Kay's service as National Chairman and in the same period, participation increased to 61 per cent. "Bill Kay was not a 'folding chairman,'" said Colby H. Chandler, S.M.'63, the retiring President.

Mr. Kay proposed two major programs for the Society during the next three years—to continue the record of increased participation in the Sloan Fellows Professorship, and to develop the former Sloan Fellows as "a talent resource for the Sloan School of Management by broadening their part in all of the School activities." In support of these programs, said Mr. Kay, there will be a semiannual newsletter for former Sloan Fellows, a program of regional meetings, and a study of additional areas of interest and future activity for the Society.

To Understand Today And Prepare for Tomorrow

The social responsibilities of modern management were the focus of a major learning experience for nearly 400 Sloan Fellows who returned to M.I.T. last fall for the triennial Sloan Fellows Convocation of former members of the oldest executive development program in U.S. business schools.

"The management of social and technological change represents the continuing challenge to the manager today," Howard W. Johnson, President of M.I.T., told the Fellows at a nostalgic opening session when many present recalled his



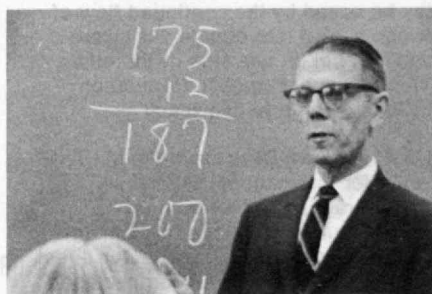
For nearly 250 Sloan Fellows, many accompanied by their wives, the 1968 edition of the triennial Sloan Fellows Convocation was an intensive learning experience and a warm social occasion rolled into one three-day Boston visit.

There were addresses by Paul A. Samuelson, Professor of Economics (above), and Robert C. Wood, then Under Secretary of the Department of Housing and Urban Development (top, center) . . .

. . . There were reunions, including (top, right) Mr. and Mrs. E. P. Brooks ('17, Emeritus Dean of the Sloan School of Management) and Mr. and Mrs. Howard W. Johnson (Dean Brooks' successor who is now President of M.I.T.) . . .

. . . There were greetings from James R. Killian, Jr. '26, Chairman of the M.I.T. Corporation (below, right) . . .

. . . There were seminars back in the old familiar classrooms—including one by Everett E. Hagen, Professor of Economics (bottom, center) . . . and . . .



association with the Sloan Fellows as Dean of the Sloan School of Management. "On the manager must fall the task of understanding the time and doing something about it," said President Johnson.

Later speakers at the two-day convocation carried into details this theme of response to human and social need. Russell De Young, S.M.'40, Chairman of the Goodyear Tire and Rubber Company, emphasized it as a principal obligation of corporate management. Business is urged to become involved in keeping the gap between technological change and social progress from further widening, he said, but some shareholders still hold "a limiting view of how much money and time should be invested in corporate citizenship." But eventually a constructive response will become a "highway to prosperity" for business by its increase in the nation's purchasing power.

John F. Collins, former Mayor of Boston who is now Visiting Professor of Urban Affairs at M.I.T., warned that "time is running out" on the nation's major urban problems. "We had better face the fact that most productive research and development programs in the U.S. result from a serious need carrying with it the promise of a hardware order," Professor Collins said in emphasizing cities' need for new technology. "But the cities have not appeared as a market," he said. The public sector—and perhaps the private sector, too—must be re-organized so that there is an incentive for leadership in solving urban issues, to give the private sector "the honorable motive of profit." For "without the private sector," said Professor Collins, speaking as a member of the public sector, "we have no way to deal with this challenge which actually menaces the viability of our economy."

Robert C. Wood, M.I.T. Professor of Political Science who is on leave as Under Secretary of the U.S. Department of Housing and Urban Development, assured the convocation audience that such incentives are indeed appearing. "The country has come of age in housing and urban affairs," said Professor Wood, and the second session of the 90th Congress will be recorded as "the most liberal in history in urban affairs." The result is the assurance, he said, "that private entrepreneurship can go into low-cost housing and come out with a profit comparable to that expected on moderate—and higher—income housing." The nation need no longer be satisfied with what we have built for urban housing in the past, Professor Wood emphasized, for "we have now given the private sector an option to experiment."

"We have passed the stage of recognizing the urban problem and debating its merits," declared Professor Wood. Today there are "few mayors who are innocent of the complexities of intervening in the process by which cities have



... and there were uncrowded, relaxing receptions in the familiar ballroom of the Sheraton-Plaza.

been built. We have achieved some coherence," he said. After a full day of such persuasion on Friday, the Sloan Fellows settled down on October 12 to a literal return to their classrooms for small faculty seminars on current business problems and interests of the Sloan School faculty. A few samples of what they heard:

William W. Kaufmann, Professor of Political Science—The traditional alliance of the Joint Chiefs of Staff and Congress against the Secretary of Defense is likely to weaken as the military pressure of the Vietnam War decreases. But it will be a hard-fought issue, for the Department of Defense will continue to claim "a substantial slice" of the nation's gross national product and so "the stakes are rather high."

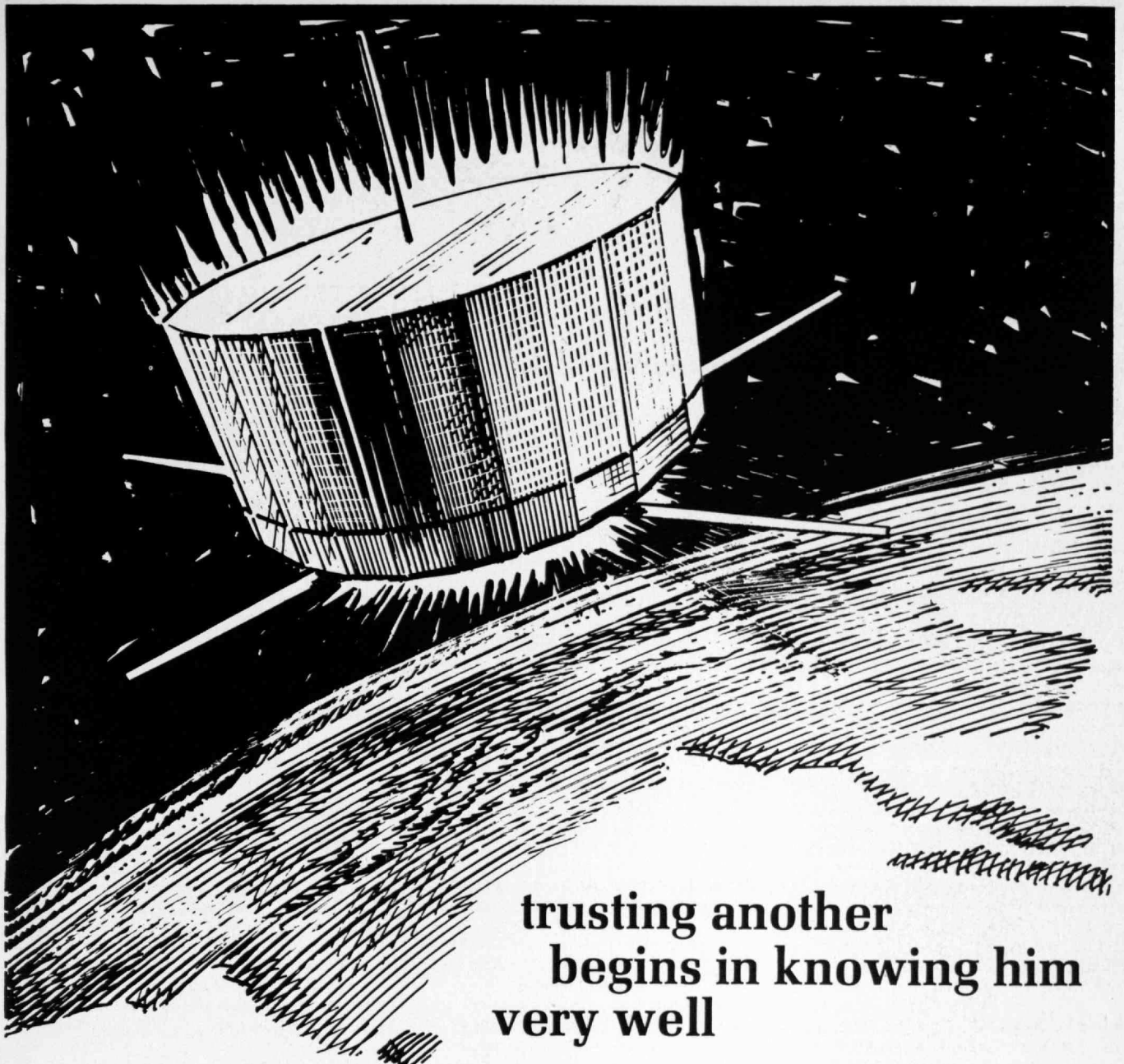
Everett E. Hagen, Professor of Economics—The volume of world trade is today \$175 billion, and it is increasing at about 7 per cent a year. The world's total money supply is increasing more slowly. But the dollar remains the principal world currency, and as a result the U.S. dollar crisis may be eased by the continued flow of foreign money into dollars. "If I were forced to bet on one side or the other, I would now bet against devaluation in the next three to five years."

Max F. Milliken, Director of the M.I.T. Center for International Studies—Three paradoxes affect both private and public American investment in underdeveloped nations: 1. Our direct national interest in the underdeveloped

world is very small, but unless we all agree to promote its development our economy may be subjected to "severe strain" in the future. 2. Both public and private investment in underdeveloped nations is inhibited by high political risk, but international investment is the only instrument we have to reduce these political risks. 3. We prefer to rely on the private sector for investment in underdeveloped nations, but private investment is likely to be "fruitless" unless we "substantially expand our public investment through foreign aid." Indeed, said Professor Milliken, "the biggest single threat" to private investment overseas is the sharp retrenchment in our foreign aid programs.

Donald G. Marquis, Professor of Organizational Psychology and Management—Successful innovations stem not from abstract thought but from practical need and experience. Technical capability and demand (meaning potential profit) must both be present for the spark of invention to catch fire.

Paul H. Cootner, Ph.D.'53, Professor of Finance—"Over any reasonable time period you choose to study, the average rate of inflation has been lower in the U.S. than in any other major industrial nation." So the dollar has achieved great strength among international bankers and their customers; their future confidence "depends on how well they think we're running the dollar." As long as the dollar has this role as an international standard, a large deficit is "a normal and desirable state;" the problem will really sharpen if holders lose faith in the dollar and demand gold.



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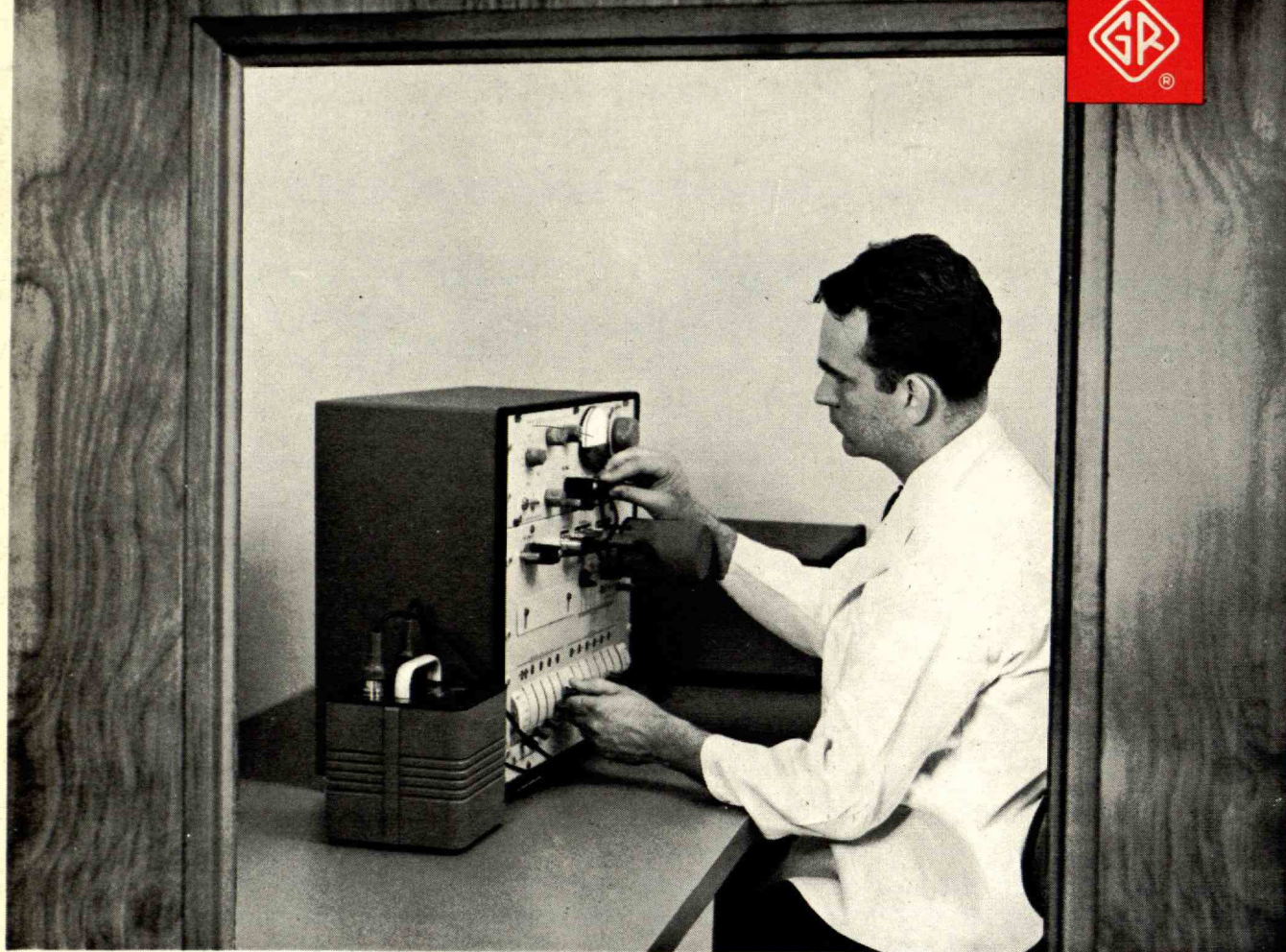
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